

Scout Report sent out
 Noted in the NID File
 Location map pinned
 Approval or Disapproval Letter
 Date Completed, P. & A. or
 operations suspended
 Pin changed on location map
 Affidavit and Record of A & P
 Water Shut-Off Test

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Commence water injection: Started injecting April, 1962

FILE NOTATIONS

Entered in NID File ☒
 Entered On S R Sheet ☒
 Location Map Pinned ☒
 Card Indexed ☒
 IWR for State or Fee Land ☐

Checked by Chief ☒
 Copy NID to Field Office ☒
 Approval Letter ☒
 Disapproval Letter ☐

COMPLETION DATA:

Date Well Completed *8-19-58*
 OW ☒ VAW _____ TA _____
 GW _____ OS _____ PA _____

Location Inspected _____
 Bond released _____
 State of Fee Land _____

LOGS FILED

Driller's Log *6-21-58*

Electric Logs (No.) *3*

E _____ I _____ E-I ☒ GR _____ GR-N _____ Micro ☒
 Lat _____ Mi-L _____ Sonic _____ Others *Radioactive*

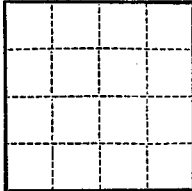
(SUBMIT IN TRIPLICATE)

Indian Agency Navajo

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Allottee Tribal

Lease No. 14-20-603-353



SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL	<input checked="" type="checkbox"/>	SUBSEQUENT REPORT OF WATER SHUT-OFF	<input type="checkbox"/>
NOTICE OF INTENTION TO CHANGE PLANS	<input type="checkbox"/>	SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING	<input type="checkbox"/>
NOTICE OF INTENTION TO TEST WATER SHUT-OFF	<input type="checkbox"/>	SUBSEQUENT REPORT OF ALTERING CASING	<input type="checkbox"/>
NOTICE OF INTENTION TO REDRILL OR REPAIR WELL	<input type="checkbox"/>	SUBSEQUENT REPORT OF REDRILLING OR REPAIR	<input type="checkbox"/>
NOTICE OF INTENTION TO SHOOT OR ACIDIZE	<input type="checkbox"/>	SUBSEQUENT REPORT OF ABANDONMENT	<input type="checkbox"/>
NOTICE OF INTENTION TO PULL OR ALTER CASING	<input type="checkbox"/>	SUPPLEMENTARY WELL HISTORY	<input type="checkbox"/>
NOTICE OF INTENTION TO ABANDON WELL	<input type="checkbox"/>		<input type="checkbox"/>

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

Denver, Colorado April 11, 19 58

Desert "A"
Well No. 9 is located 510 ft. from [N] line and 1830 ft. from [W] line of sec. 17

NE/4 NW/4 Sec. 17 41S 24E S.L.M.
(1/4 Sec. and Sec. No.) (Twp.) (Range) (Meridian)

Ratherford San Juan Utah
(Field) (County or Subdivision) (State or Territory)

The elevation of the ungraded ground ~~surface~~ above sea level is 4734 ft.

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

Drill 17 1/4" hole to approximately 150', set 150' of 13-3/8" conductor pipe and cement to surface. Drill 11" hole to approximately 1400', set 8-5/8" casing and cement to surface. Drill 7-7/8" hole to total depth of approximately 5750', run 5 1/2" casing and cement with approximately 250 sacks. Complete in Paradox formation.

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Phillips Petroleum Company

Address 1200 Denver Club Building

Denver 2, Colorado

By W. M. Schul
W. M. Schul
Title Division Superintendent

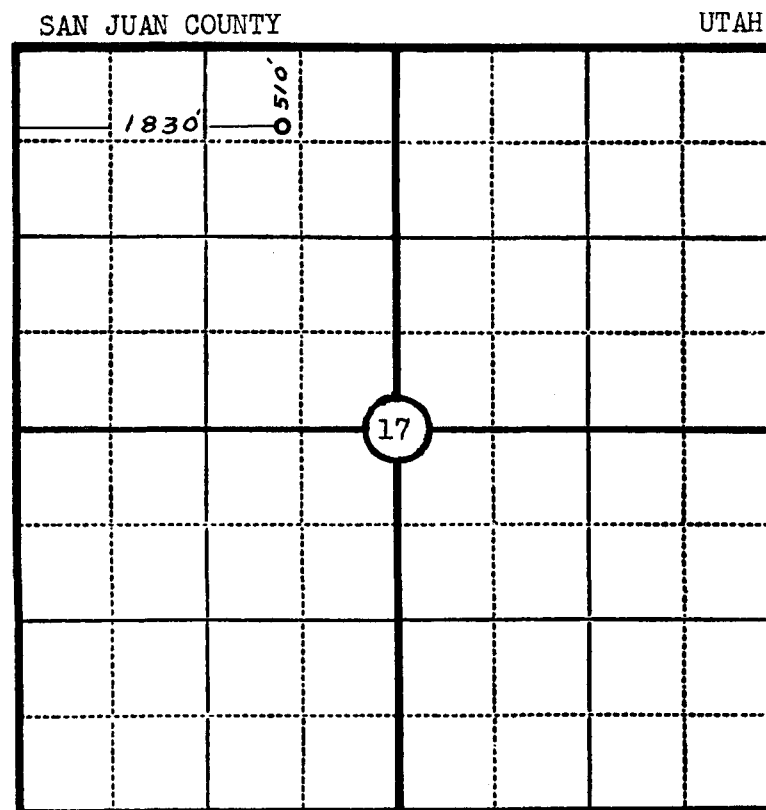
Company..... PHILLIPS PETROLEUM COMPANY

Lease..... DESERT "A"..... Well No..... 9.....

Sec..... 17....., T. 41 SOUTH....., R. 24 EAST S.L.M.

Location..... 510' FROM THE NORTH LINE AND 1830' FROM
THE WEST LINE.

Elevation..... 4733.6 UNGRADED GROUND



Scale—4 inches equal 1 mile.

This is to certify that the above plat was prepared from field notes of actual surveys made by me or under my supervision and that the same are true and correct to the best of my knowledge and belief.

Seal:

James P. Leese

Registered Land Surveyor.

JAMES P. LEESE

UTAH REG. NO. 1472

Surveyed..... 20 MARCH....., 19 58

SAN JUAN ENGINEERING COMPANY, FARMINGTON, N. M.

April 14, 1958

Phillips Petroleum Company
1200 Denver Club Building
Denver 2, Colorado

Attention: W. M. Schul, Division Superintendent

Gentlemen:

This is to acknowledge receipt of your notice of intention to drill Well No. Desert A - 9, which is to be located 510 feet from the north line and 1830 feet from the west line of Section 17, Township 41 South, Range 24 East, S1EM, San Juan County, Utah.

Please be advised that insofar as this office is concerned, approval to drill said well is hereby granted.

This approval terminates within 90 days if the above mentioned well is not spudded in within said period.

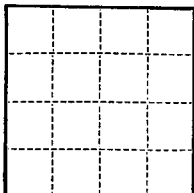
Yours very truly,

OIL & GAS CONSERVATION COMMISSION

CLEON B. FEIGHT
SECRETARY

CBF:cn

cc: Phil McGrath
USGS, Farmington,
New Mexico



(SUBMIT IN TRIPLICATE)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Indian Agency Bureau

Allottee W. H. Cohn

Lease No. 11-00-002-000

71-H
5-7

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL	SUBSEQUENT REPORT OF WATER SHUT-OFF	<input checked="" type="checkbox"/>
NOTICE OF INTENTION TO CHANGE PLANS	SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING	
NOTICE OF INTENTION TO TEST WATER SHUT-OFF	SUBSEQUENT REPORT OF ALTERING CASING	
NOTICE OF INTENTION TO REDRILL OR REPAIR WELL	SUBSEQUENT REPORT OF REDRILLING OR REPAIR	
NOTICE OF INTENTION TO SHOOT OR ACIDIZE	SUBSEQUENT REPORT OF ABANDONMENT	
NOTICE OF INTENTION TO PULL OR ALTER CASING	SUPPLEMENTARY WELL HISTORY	
NOTICE OF INTENTION TO ABANDON WELL		

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

Denver, Colorado April 29, 19 58
Desert "A"
Well No. 9 is located 520 ft. from N line and 1030 ft. from W line of sec. 17
NE 1/4 SW 1/4 Sec. 17 41S 2E S. 1. N.
(1/4 Sec. and Sec. No.) (Twp.) (Range) (Meridian)
Rutherford San Juan Utah
(Field) (County or Subdivision) (State or Territory)

The elevation of the derrick floor above sea level is 4709 ft.

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudlogging jobs, cementing points, and all other important proposed work)

Spudded 17 1/2" hole at 12 midnight 4-24-58. Drilled to 172'. Ran 13-3/8" OD 27.1# Armo 30 lb casing set at 171.90' F.M. Cemented with 175 sacks regular cement. Plug pumped to 156' at 2:50 p.m. 4-25-58. Cement circulated. WOC 24 hours, drilled plug, tested casing 500' for 30 minutes, held OK.

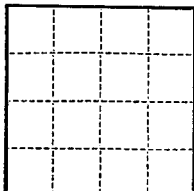
I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Phillips Petroleum Company

Address 1200 Denver Club Building

Denver 2, Colorado

By W. H. Cohn
Title Division Superintendent



(SUBMIT IN TRIPLICATE)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Indian Agency Navajo

Allottee Trilok

Lease No. 14-28-403-253

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL	SUBSEQUENT REPORT OF WATER SHUT-OFF	<input checked="" type="checkbox"/>
NOTICE OF INTENTION TO CHANGE PLANS	SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING	
NOTICE OF INTENTION TO TEST WATER SHUT-OFF	SUBSEQUENT REPORT OF ALTERING CASING	
NOTICE OF INTENTION TO REDRILL OR REPAIR WELL	SUBSEQUENT REPORT OF REDRILLING OR REPAIR	
NOTICE OF INTENTION TO SHOOT OR ACIDIZE	SUBSEQUENT REPORT OF ABANDONMENT	
NOTICE OF INTENTION TO PULL OR ALTER CASING	SUPPLEMENTARY WELL HISTORY	
NOTICE OF INTENTION TO ABANDON WELL		

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

Desert "A" Denver, Colorado April 29, 19 52

Well No. 9 is located 510 ft. from N line and 1630 ft. from W line of sec. 17

NE/4 NW/4 Sec. 17 41S 24E S.1.M.

(1/4 Sec. and Sec. No.) (Twp.) (Range) (Meridian)

Katharford San Juan Utah

(Field) (County or Subdivision) (State or Territory)

The elevation of the derrick floor above sea level is 4749 ft.

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

Drilled to 1525'. Ran 6-5/8" OD 24 3/4 355 casing set 1525' WKB. Cemented with 298 sacks regular cement, 130 sacks Diaseal "B", 590# calcium chloride, 143# Floccs, 594# Raf-Plug, followed with 125 sacks neat cement on bottom. Pumped plug to 1347' at 8:15 p.m. 4-27-58. Cement did not circulate. Ran 1" pipe down annulus to 200', re-cemented to surface with 10 sacks regular cement. Set 1 hour, cement fell back 10'. Re-cemented to surface through 1" with 10 sacks regular cement. 100 24 hours. Drilled plug and tested casing with 500# for 30 minutes, held OK.

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Phillips Petroleum Company

Address 1200 Denver Club Building

Denver 2, Colorado

By W. M. Schul
Title Division Superintendent

PHILLIPS PETROLEUM COMPANY

1200 Denver Club Building
Denver 2, Colorado

May 15, 1958

Mr. Cleon B. Feight
Secretary
Utah Oil & Gas Conservation Commission
State Capitol Building
Salt Lake City, Utah


Dear Mr. Feight

Enclosed herewith please find two copies of each of the following logs run on Phillips Petroleum - Aztec Oil and Gas Company's Desert "A" #9, San Juan County, Utah.

1. Schlumberger Induction-Electric Logs
2. Schlumberger Micro Logs

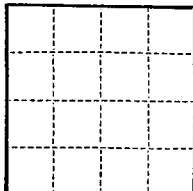
Very truly yours,

PHILLIPS PETROLEUM COMPANY


W. M. Schul
Division Superintendent

CCK:lb

Enclosures



(SUBMIT IN TRIPLICATE)

Indian Agency Navajo

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Allottee Tribal

Lease No. 14-28-403-323

SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL	SUBSEQUENT REPORT OF WATER SHUT-OFF	<input checked="" type="checkbox"/>
NOTICE OF INTENTION TO CHANGE PLANS	SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING	
NOTICE OF INTENTION TO TEST WATER SHUT-OFF	SUBSEQUENT REPORT OF ALTERING CASING	
NOTICE OF INTENTION TO REDRILL OR REPAIR WELL	SUBSEQUENT REPORT OF REDRILLING OR REPAIR	
NOTICE OF INTENTION TO SHOOT OR ACIDIZE	SUBSEQUENT REPORT OF ABANDONMENT	
NOTICE OF INTENTION TO PULL OR ALTER CASING	SUPPLEMENTARY WELL HISTORY	
NOTICE OF INTENTION TO ABANDON WELL		

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

Denver, Colorado May 13, 19 50

Desert "A"

Well No. 9 is located 510 ft. from [N] line and 1430 ft. from [W] line of sec. 17

NE/4 SW/4 Sec. 17

41S

24E

S.L.M.

(1/4 Sec. and Sec. No.)

(Twp.)

(Range)

(Meridian)

Rutherford

San Juan

Utah

(Field)

(County or Subdivision)

(State or Territory)

The elevation of the derrick floor above sea level is 4749 ft.

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

Drilled to 5730'. Ran 5 1/2" OD 14# and 15.5# casing set at 5729' RKB. Cemented with 132 sacks regular cement, 100 sacks Diaseal "D" and 496# calcium chloride. Pumped plug to 5711' at 2:36 p.m. May 13, 1950. WOC 24 hours. Tested casing with 900# for 30 minutes, held OK.

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Phillips Petroleum Company

Address 1200 Denver Club Building

Denver 2, Colorado

By [Signature]
W. H. Schul
Title Division Superintendent

PHILLIPS PETROLEUM COMPANY

1200 Denver Club Building
Denver 2, Colorado

May 22, 1958

Mr. Cleon B. Feight
Secretary
Utah Oil & Gas Conservation Commission
State Capitol Building
Salt Lake City, Utah

Dear Mr. Feight:

Enclosed herewith please find two copies of Lane Wells Radioactivity Log ran on Phillips Petroleum - Aztec Oil and Gas Company's Desert "A" #9, San Juan County, Utah.

Very truly yours,

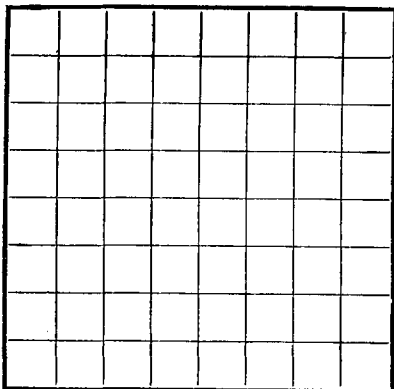
PHILLIPS PETROLEUM COMPANY



W. M. Schul
Division Superintendent

CCK:lb

13



U. S. LAND OFFICE Navajo
 SERIAL NUMBER 14-20-603-353
 LEASE OR PERMIT TO PROSPECT _____

UNITED STATES
 DEPARTMENT OF THE INTERIOR
 GEOLOGICAL SURVEY

LOG OF OIL OR GAS WELL

LOCATE WELL CORRECTLY

Company Phillips Petroleum Company Address 1200 Denver Club Building
Astec Oil & Gas Company Denver 2, Colorado
 Lessor or Tract Desert "A" Field Rutherford State Utah
 Well No. 9 Sec. 17 T. 41S R. 24E Meridian Salt Lake County San Juan
 Location 510 ft. S. of N. Line and 1830 ft. E. of W. Line of Sec. 17 Elevation 4749
 (Derrick floor relative to sea level)

The information given herewith is a complete and correct record of the well and all work done thereon so far as can be determined from all available records.

Signed _____
 Date June 11, 1958 Title Division Superintendent

The summary on this page is for the condition of the well at above date.

Commenced drilling April 24, 1958 Finished drilling May 15, 1958

OIL OR GAS SANDS OR ZONES

(Denote gas by G)

No. 1, from _____ to _____ No. 4, from _____ to _____
 No. 2, from _____ to _____ No. 5, from _____ to _____
 No. 3, from _____ to _____ No. 6, from _____ to _____

IMPORTANT WATER SANDS

No. 1, from _____ to _____ No. 3, from _____ to _____
 No. 2, from _____ to _____ No. 4, from _____ to _____

CASING RECORD

Size casing	Weight per foot	Threads per inch	Make	Amount	Kind of shoe	Cut and pulled from	Perforated		Purpose
							From—	To—	
13-3/8"	27.12	SJ	Armen	162'	Baker				
8-5/8"	24.8	8	J-55	162'	Baker				
5-1/2"	14.8	8	J-55	560'	Baker				
5-1/2"	15.5	8	J-55	178'	Baker				
PRODUCTION									

MUDDING AND CEMENTING RECORD

Size casing	Where set	Number sacks of cement	Method used	Mud gravity	Amount of mud used
13-3/8"	171.5'	175	Circ.		
8-5/8"	1525'	603	Circ.		
5-1/2"	5729'	232	Ballib.		

PLUGS AND ADAPTERS

Heaving plug—Material _____ Length _____ Depth set _____
 Adapters—Material _____ Size _____

FOLD HERE

13-3/8"	171.5'	175	Circ.		
5-5/8"	1525'	603	Circ.		
1-1/2"	5729'	232	Ballib.		

FOLD MAPS

PLUGS AND ADAPTERS

Heaving plug—Material _____ Length _____ Depth set _____

Adapters—Material _____ Size _____

SHOOTING RECORD

Size	Shell used	Explosive used	Quantity	Date	Depth shot	Depth cleaned out

TOOLS USED

Rotary tools were used from 0 feet to 5730 feet, and from _____ feet to _____ feet

Cable tools were used from _____ feet to _____ feet, and from _____ feet to _____ feet

DATES

May 19, 1958 Put to producing May 19, 1958

The production for the first 213 hours was 213 barrels of fluid of which 100% was oil; _____% emulsion; _____% water; and _____% sediment. Gravity, °Bé. 42

If gas well, cu. ft. per 24 hours _____ Gallons gasoline per 1,000 cu. ft. of gas _____

Rock pressure, lbs. per sq. in. 395

EMPLOYEES

Moran Bros., Inc. _____, Driller _____, Driller
 _____, Driller _____, Driller

FORMATION RECORD

FROM—	TO—	TOTAL FEET	FORMATION
2355	2422	67	Shinarump
2422	2578	156	Moenkopi
2578	2650	72	Hoskint
2650	2810	160	Deshally
2810	4050	1240	Organ Rock
4050	4546	496	Rico
4546	5510	964	Upper Hermosa
5510	5730	220	Paradox

[OVER]

16-43094-4

EXPLORATION RECORD—CONTINUOUS

JUN 12 1958

16-43094-2 U. S. GOVERNMENT PRINTING OFFICE

It is of the greatest importance to have a complete history of the well. Please state in detail the dates of redrilling, together with the reasons for the work and its results. If there were any changes made in the casing, state fully, and if any casing was "sidetracked" or left in the well, give its size and location. If the well has been dynamited, give date, size, position, and number of shots. If plugs or bridges were put in to test for water, state kind of material used, position, and results of pumping or bailing.

Spudded 17-1/4" hole at 12 midnight April 24, 1958. Drilled to 172' and ran 13-3/8" OD 27.17 Armco Sx SJ casing set at 171.50' RKB, cemented with 175 sacks regular cement. Pumped plug to 158' at 2:50 p.m. April 25, cement circulated. NOC 24 hrs., drilled plug, tested casing with 500# for 30 minutes, held OK. Drilled to 1525', ran 8-5/8" OD 24# J-55 casing set at 1525' RKB. Cemented with 298 sx. reg. cement, 110 sx. Diacel "D", 550# calcium chloride, 145# Fluocel, 594# Tuf-Plug, followed with 125 sx neat cement on bottom. Pumped plug to 1347' at 8:15 p.m. April 27. Cement did not circulate. Ran 1" pipe down annulus to 200', recemented to surface with 60 sx. regular cement. Set 1 hour, cement fell back 10'. Re-cemented to surface thru 1" with 10 sx. reg. cement. NOC 24 hrs. Drilled plug at 8:15 p.m. April 28. Test casing with 500# for 30 min. held OK. Drilled to 5730' and ran 5-1/2" OD 14# & 15.5# J-55 casing set at 5729' RKB. Cemented with 132 sx. reg. cement, 100 sx. Diacel "D" and 495# calcium chloride. Pumped plug to 5711' at 2:36 p.m. May 13. NOC 24 hours. Tested casing with 500# for 30 minutes, held OK. Perforated with four 1/2" holes per foot 5512-26, 5536-44, 5552-70, 5610-50, 5654-68 and 5674-85. Ran 2-7/8" tubing with packer, tubing set 5651, packer set 5422. Checked total depth at 5708. Displaced water with 50 barrels of oil, spotted acid on formation. Pumped 9000 gallons Howell 35% acid into formation, maximum pressure 2800#, minimum pressure 2600#. Flushed with 40 barrels of oil. Average treating rate 6 barrels per minute on acid and 5 barrels per minute on flush. Flowed 1 hr. and 40 minutes to pits to clean up. Switched to tanks and flowed 4 hours on 3/4" choke 212.61 barrels of oil, no water. Opening tubing pressure 410#, final 395#. Flowing at rate of 1276 BOPD, shut in for tank room.

President of District _____ Field _____ State _____
 Company _____ Address _____

 LOCATE WITH CORRESPONDENCE

[illegible]

ГОС ОЕ ОИГ ОБ СВЗ МЕГГ

GEOLOGICAL SURVEY

DEPARTMENT OF THE INTERIOR

UNITED STATES

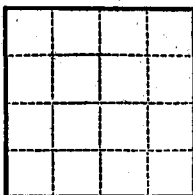
TYPE OF PERSON TO BE RECALLED _____
 DATE OF BIRTH _____
 CITY/TOWN _____

(SUBMIT IN TRIPLICATE)

Indian Agency Navajo

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Allottee Tribal
Lease No. 14-00-403-320



SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL	SUBSEQUENT REPORT OF WATER SHUT-OFF
NOTICE OF INTENTION TO CHANGE PLANS	SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING
NOTICE OF INTENTION TO TEST WATER SHUT-OFF	SUBSEQUENT REPORT OF ALTERING CASING
NOTICE OF INTENTION TO REDRILL OR REPAIR WELL	SUBSEQUENT REPORT OF REDRILLING OR REPAIR
NOTICE OF INTENTION TO SHOOT OR ACIDIZE	SUBSEQUENT REPORT OF ABANDONMENT
NOTICE OF INTENTION TO PULL OR ALTER CASING	SUPPLEMENTARY WELL HISTORY
NOTICE OF INTENTION TO ABANDON WELL	<u>Conversion of well to water injection</u>

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

Rutherford Unit

May 2, 1962

Well No. 17W21 is located 510 ft. from N line and 1030 ft. from W line of sec. 17
(Formerly Phillips' Desert "A" #1, then Rutherford Unit 17-21, See Note)
NE/4 NW/4 Sec. 17 34E S.1.M.
(1/4 Sec. and Sec. No.) (Twp.) (Range) (Meridian)
Rutherford San Juan County Utah
(Field) (County or Subdivision) (State or Territory)

The elevation of the derrick floor above sea level is 4749 ft.

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

- 1/23/62 Moved in R&R Well Service Unit to kill well, pull rods and tubing, cement line tubing, rerun and convert to water injection. Previous Production: 401 BO, 0 BW, GOR 1324.
- 1/24 Pulled tubing.
- 1/25 through 1/30 Idle
- 1/31 Moved in R&R Well Service Unit to run cement lined tubing.
- 2/1/62 Ran 2-1/2" EUE Cement Lined tubing with Baker HQ Hookwall Packer.
- 2/2 through 4/29/62 Waiting on completion of Rutherford Unit Waterflood Pump Station.
- 4/30/62 Started water injection into Paradox 2:45 PM 4/30/62. Injected 329 BW in 5 hours. Tubing Pressure - no gauge to 0#.

NOTE: Well number changed from 17-21 to 17W21 to indicate ~~sum~~ change from oil well to water injection well.

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company PHILLIPS PETROLEUM COMPANY

Address P. O. DRAWER 1150

CORTEZ, COLORADO

By C. M. Boles

C. M. Boles
Title District Superintendent

(SUBMIT IN TRIPLICATE)

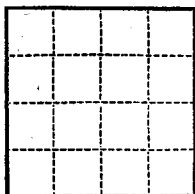
Indian Agency _____

NAVAJO

Allottee TRIBAL

Lease No. 14-20-603-353

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY



SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL _____	SUBSEQUENT REPORT OF WATER SHUT-OFF _____
NOTICE OF INTENTION TO CHANGE PLANS _____	SUBSEQUENT REPORT OF SHOOTING OR ACIDIZING _____
NOTICE OF INTENTION TO TEST WATER SHUT-OFF _____	SUBSEQUENT REPORT OF ALTERING CASING _____
NOTICE OF INTENTION TO REDRILL OR REPAIR WELL _____	SUBSEQUENT REPORT OF REDRILLING OR REPAIR _____
NOTICE OF INTENTION TO SHOOT ACIDIZE _____	SUBSEQUENT REPORT OF ABANDONMENT _____
NOTICE OF INTENTION TO PULL OR ALTER CASING _____	SUPPLEMENTARY WELL HISTORY _____
NOTICE OF INTENTION TO ABANDON WELL _____	

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

Cortes, Colorado

September 17, 1963

Ratherford Unit

Well No. 1721 is located 510 ft. from [N] line and 1830 ft. from [E] line of sec. 17

NE 1/4 NW 1/4 Sec. 17

(1/4 Sec. and Sec. No.)

41S

(Twp.)

24E

(Range)

SLM

(Meridian)

Ratherford

(Field)

San Juan County

(County or Subdivision)

Utah

(State or Territory)

The elevation of the derrick floor above sea level is 4749 ft.

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

Acidize Water Injection Well with 2,000 gallons regular 15% acid, 300 gallons Sol-Bleck, 2,000 gallons regular 15% acid, 300 gallons Sol Block, 2,000 gallons regular 15% acid.

Present Injection Rate: 793 BWPD at 280#.

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company Phillips Petroleum Company

Address P. O. Drawer 1150

Cortes, Colorado

By C. M. Boles
Dist. Supt.

Title _____

(SUBMIT IN TRIPLICATE)

Indian Agency

NAVAJO

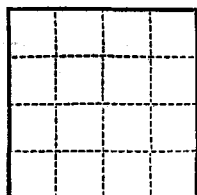
UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Allottee

TRIAL

Lease No.

14-80-603-353



SUNDRY NOTICES AND REPORTS ON WELLS

NOTICE OF INTENTION TO DRILL	SUBSEQUENT REPORT OF WATER SHUT-OFF	
NOTICE OF INTENTION TO CHANGE PLANS	SUBSEQUENT REPORT OF SUBSEQUENT ACIDIZING	X
NOTICE OF INTENTION TO TEST WATER SHUT-OFF	SUBSEQUENT REPORT OF ALTERING CASING	
NOTICE OF INTENTION TO REDRILL OR REPAIR WELL	SUBSEQUENT REPORT OF REDRILLING OR REPAIR	
NOTICE OF INTENTION TO SHOOT OR ACIDIZE	SUBSEQUENT REPORT OF ABANDONMENT	
NOTICE OF INTENTION TO PULL OR ALTER CASING	SUPPLEMENTARY WELL HISTORY	
NOTICE OF INTENTION TO ABANDON WELL		

(INDICATE ABOVE BY CHECK MARK NATURE OF REPORT, NOTICE, OR OTHER DATA)

Ratherford Unit

Cortez, Colorado September 25, 1963

Well No. 17W21 is located 510 ft. from ^N~~XX~~ line and 1830 ft. from ^W~~XX~~ line of sec. 17

NE/4 NW/4 Sec. 17 41 S 24 E 3 L M
(1/4 Sec. and Sec. No.) (Twp.) (Range) (Meridian)
Ratherford San Juan Utah
(Field) (County or Subdivision) (State or Territory)

The elevation of the derrick floor above sea level is 4749 ft.

DETAILS OF WORK

(State names of and expected depths to objective sands; show sizes, weights, and lengths of proposed casings; indicate mudding jobs, cementing points, and all other important proposed work)

September 18, 1963: Pulled 2 1/2" cement lined tubing and packer. Picked up 2 1/2" bare tubing and packer. Western Company acidized with 2,000 gallons regular 15% acid, 300 gallons Sol-Block, 2,000 gallons regular 15% acid, 300 gallons Sol-Block and 2,000 gallons regular 15% acid. Maximum pressure 3400#. When acid hit formation, pressure dropped to zero. First block on formation 200#, increased to 1000#, broke to 100#. Second block on formation 100#, increased to 700#, broke to 0#. Flushed with 48 barrels salt water. Average acid and flush injection rate 5 BPM. Hooked well up to inject overnight. Injected 1981 barrels in 16 hours at 0#. Completed acidizing at 2:00 P.M. 9/19/63.

September 20, 1963: Pulled 2 1/2" plain tubing and reran 172 jts. 2 1/2" cement lined tubing with Baker EQJ Packer. Hooked well up for injection.

Present Injection Rate: 2956 BWPD At 0#(Desert Creek Zone, Greater Aneth-Paradox)

I understand that this plan of work must receive approval in writing by the Geological Survey before operations may be commenced.

Company PHILLIPS PETROLEUM COMPANY

Address P. O. Drawer 1150

Cortez, Colorado

By C. M. Bolus
Dist. Supt.

Title

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEYSUBMIT IN TRI
(Other instructio.
verse side)1TB*
n reForm approved *PWJ*
Budget Bureau No. 42-R1424

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <input checked="" type="checkbox"/> Water Injection Well	5. LEASE DESIGNATION AND SERIAL NO. 14-20-693-353
2. NAME OF OPERATOR Phillips Petroleum Company	6. IF INDIAN, ALLOTTEE OR TRIBE NAME Navajo
3. ADDRESS OF OPERATOR Drawer 1150, Cortez, Colorado 81321	7. UNIT AGREEMENT NAME SN I-4192
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface NE, NW Sec. 17 510' FNL, 1830' FWL	8. FIELD OR LEASE NAME Rutherford Unit
14. PERMIT NO.	9. FIELD AND POOL NAME 17-21
15. ELEVATIONS (Show whether DF, RT, GR, etc.) 4749' DF	10. FIELD AND POOL NAME 17-21
	11. COUNTY OR PARISH AND SURVEY OR AREA San Juan Utah
	12. COUNTY OR PARISH San Juan 13. STATE Utah

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF ☐FRACTURE TREAT ☐SHOOT OR ACIDIZE ☒REPAIR WELL ☐(Other) ☐PULL OR ALTER CASING ☐MULTIPLE COMPLETE ☐ABANDON* ☐CHANGE PLANS ☐

SUBSEQUENT REPORT OF:

WATER SHUT-OFF ☐FRACTURE TREATMENT ☐SHOOTING OR ACIDIZING ☐(Other) ☐REPAIRING WELL ☐ALTERING CASING ☐ABANDONMENT* ☐

(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

Acidize water injection well with 1000 gallons regular acid in attempt to increase water injection rate.

Present injection rate: 1281 BWPD at 340#.

18. I hereby certify that the foregoing is true and correct

SIGNED

C. M. Boles
C. M. Boles

TITLE

Area Superintendent

DATE

3-2-65

(This space for Federal or State office use)

APPROVED BY

TITLE

DATE

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEYSUBMIT IN TF
(Other instruct.
verse side)DATE*
or re-Form approved.
Budget Bureau No. 42-R1424.

5. LEASE DESIGNATION AND SERIAL NO.

11-20-603-353

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

Navajo

7. UNIT AGREEMENT NAME

SW-I-4192

8. FARM OR LEASE NAME

Ratherford Unit

9. WELL NO.

17421

10. FIELD AND POOL, OR WILDCAT

Greater Aneth

11. SEC., T., R., M., OR B.L.K. AND
SURVEY OR AREA

17-41S-24E, S1M

12. COUNTY ~~OKLAHOMA~~ 13. STATE

San Juan

Utah

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals.)1. OIL WELL ☐ GAS WELL ☐ OTHER ☒ Water Injection Well

2. NAME OF OPERATOR

Phillips Petroleum Company

3. ADDRESS OF OPERATOR

Drawer 1150, Cortez, Colorado 81321

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*
See also space 17 below.)

At surface

NE, NW Sec. 17 510' FNL, 1830' FNL

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)

4749' DF

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF ☐FRACTURE TREAT ☐SHOOT OR ACIDIZE ☐REPAIR WELL ☐(Other) ☐PULL OR ALTER CASING ☐MULTIPLE COMPLETE ☐ABANDON* ☐CHANGE PLANS ☐

SUBSEQUENT REPORT OF:

WATER SHUT-OFF ☐FRACTURE TREATMENT ☐SHOOTING OR ACIDIZING ☒(Other) ☐REPAIRING WELL ☐ALTERING CASING ☐ABANDONMENT* ☐(NOTE: Report results of multiple completion on Well
Completion or Recompletion Report and Log form.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

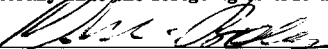
On June 3, 1965, unseated packer, acidized down annulus with 1000 gallons Western Company 15% regular acid, reset packer, resumed water injection down tubing.

Previous injection rate into Desert Creek Zone of Paradox Formation, Greater Aneth Field:
913 BWPD at 44.5%.

Present injection rate into Desert Creek Zone of Paradox Formation, Greater Aneth Field:
3600 BWPD on vacuum.

18. I hereby certify that the foregoing is true and correct

SIGNED


C. H. Hales

TITLE

District Superintendent

DATE

6-23-65

(This space for Federal or State office use)

APPROVED BY

TITLE

DATE

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEYSUBMIT IN THE DATE*
(Other instructions on reverse side)Form approved.
Budget Bureau No. 42-R1424.

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <input checked="" type="checkbox"/> Water Injection Well		5. LEASE DESIGNATION AND SERIAL NO. 14-20-603-353
2. NAME OF OPERATOR Phillips Petroleum Company		6. IF INDIAN, ALLOTTEE OR TRIBE NAME Navajo
3. ADDRESS OF OPERATOR Drawer 1150, Cortez, Colorado 81321		7. UNIT AGREEMENT NAME SW-I-4192
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface NE NW Sec. 17 510' FWL, 1830' FWL Section 17		8. FARM OR LEASE NAME Rutherford Unit
14. PERMIT NO.		9. WELL NO. 17021
15. ELEVATIONS (Show whether DF, RT, GR, etc.) 4749' D.F.		10. FIELD AND POOL, OR WILDCAT Greater Smith Field
		11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA 17-412-24N S.L.M.
		12. COUNTY San Juan 13. STATE Utah

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF ☐FRACTURE TREAT ☐SHOOT OR ACIDIZE ☒REPAIR WELL ☐(Other) ☐PULL OR ALTER CASING ☐MULTIPLE COMPLETE ☐ABANDON* ☐CHANGE PLANS ☐

SUBSEQUENT REPORT OF:

WATER SHUT-OFF ☐FRACTURE TREATMENT ☐SHOOTING OR ACIDIZING ☐(Other) ☐REPAIRING WELL ☐ALTERING CASING ☐ABANDONMENT* ☐

(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

Acidize water injection well with 5000 gallons 15% regular acid and resume water injection.

Present Injection Rate: Injected 593 BWPD at 5356.

18. I hereby certify that the foregoing is true and correct

SIGNED

C. N. Dolan

TITLE

District Superintendent

DATE

11-21-66

(This space for Federal or State office use)

APPROVED BY

TITLE

DATE

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEYSUBMIT IN TR.
(Other instructions
reverse side)2*
reForm approved.
Budget Bureau No. 42-R1424.

5. LEASE DESIGNATION AND SERIAL NO.

14-20-403-353

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

Navajo

7. UNIT AGREEMENT NAME

NW-1-4192

8. FARM OR LEASE NAME

Hatherton Unit

9. WELL NO.

17N21

10. FIELD AND POOL, OR WILDCAT

Greater South

11. SEC., T., R., M., OR BLK. AND
SURVEY OR AREA

17-415-24N S.L.M.

1.

OIL
WELL ☐GAS
WELL ☐

OTHER

Water Injection Well

2. NAME OF OPERATOR

Phillips Petroleum Co.

3. ADDRESS OF OPERATOR

Drawer 1150, Cortez, Colorado 81321

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*
See also space 17 below.)

At surface

NE NW Sec. 17 S10' FWL; 1890' FWL
Section 17

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)

4749' D.F.

12. COUNTY OR PARISH

San Juan

13. STATE

Utah

16.

Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF ☐FRACTURE TREAT ☐SHOOT OR ACIDIZE ☐REPAIR WELL ☐(Other) ☐PULL OR ALTER CASING ☐MULTIPLE COMPLETE ☐ABANDON* ☐CHANGE PLANS ☐

SUBSEQUENT REPORT OF:

WATER SHUT-OFF ☐FRACTURE TREATMENT ☒SHOOTING OR ACIDIZING ☐(Other) ☐REPAIRING WELL ☐ALTERING CASING ☐ABANDONMENT* ☐(NOTE: Report results of multiple completion on Well
Completion or Recompletion Report and Log form.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

Pulled cement lined tubing, ran 2 1/2" bare tubing. On November 23, 1966 acidized Desert Creek perforations 5512-5683' O/W with 3000 gallons 15% acid and 1000 gallons salt plug in 2 stages. Pulled bare tubing, reran cement lined tubing, resumed injection.

PREVIOUS INJECTION RATE: 393 BWPD at 535#

PRESENT INJECTION RATE: 3500 BWPD on vacuum

18. I hereby certify that the foregoing is true and correct

SIGNED

C. N. Bales

TITLE

District Superintendent

DATE

12-8-66

(This space for Federal or State office use)

APPROVED BY

TITLE

DATE

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

PHILLIPS PETROLEUM COMPANY
P. O. Drawer 1150
Cortez, Colorado 81321

December 31, 1966

In re: Ratherford Unit Monthly Operating Report
November 1966

Page No. 3

Swabbed well, pulled tubing with packer, reran tubing and rods and started well pumping on November 25, 1966. Daily production was 18 BO and 690 BW before the treatment, and nine days following the treatment, production was 108 BO and 1 BW.

Ratherford Unit 16W43 (Acid Job)

On October 22, 1966 pulled cement lined tubing, reran 2½" tubing with retrievematic packer and set at 5469'. Unable to acidize due to high pressure injection system being down. On November 16 acidized Desert Creek Zone I through 2½" bare tubing and packer with 15,000 gallons 28% acid in three stages, each stage separated by 1000 gallons salt plug mixed 3.4#/gallon. Hooked back up for injection. Daily injection rate was 118 BW at 2225# before the treatment and six days following the treatment, the injection rate was 210 BW at 2400#.

Ratherford Unit 17W21 (Acid Job)

On November 21, 1966 pulled cement lined tubing, ran 2½" tubing and retrievematic packer, set at 5480'. Acidized Desert Creek Zone II through 2½" bare tubing and packer with 5000 gallons 15% acid in two stages separated by 1000 gallons salt plug mixed 3#/gallon. Hooked back up for injection. On November 30, 1966 pulled 2½" tubing with packer, reran 2½" cement lined tubing, resumed injection. Daily injection rate was 593 BW at 535# before the treatment, and nine days following the treatment, the injection rate was 3500 BW on vacuum.

Ratherford Unit 29W21 (Acid Job)

On November 4, 1966 acidized Desert Creek Zone II perforations through 2½" bare tubing and packer with 5000 gallons 15% acid in two stages separated by 1000 gallons salt plug mixed 3#/gallon. Resumed injection. Daily injection rate was 518 BW at 445# before the treatment and 4 days following the treatment, the injection rate was 3456 BW on vacuum.

Respectfully submitted,
PHILLIPS PETROLEUM COMPANY

C M Boles

C. M. Boles
District Superintendent

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEYSUBMIT IN TRIP...E*
(Other instructions on re-
verse side)Form approved.
Budget Bureau No. 42-R1424

5. LEASE DESIGNATION AND SERIAL NO.

14-20-60-353

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

Navajo

7. UNIT AGREEMENT NAME

R-1-1192

8. FARM OR LEASE NAME

Rutherford Unit

9. WELL NO.

17N21

10. FIELD AND POOL, OR WILDCAT

Greater Aneth

11. SEC., T., R., M., OR BLK. AND
SURVEY OR AREA

17-41S-24E 35N

12. COUNTY OR TERRITORY

San Juan

13. STATE

Utah

1. OIL ☐ GAS ☐ OTHER ☒ Water Injection Well

2. NAME OF OPERATOR

Phillips Petroleum Company

3. ADDRESS OF OPERATOR

Drawer 1150, Cortez, Colorado 81321

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*

See also space 17 below.)

At surface

510' FNL and 1830' FVL, Sec. 17 NE NW

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)

4749 DF

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF ☐PULL OR ALTER CASING ☐FRACTURE TREAT ☐MULTIPLE COMPLETE ☐SHOOT OR ACIDIZE ☐ABANDON* ☐REPAIR WELL ☐CHARGE PLUG ☐(Other) ☒ Squeeze cement Zone II & III, acidize(Other) ☒ Zone I, resume inj into Zone I

SUBSEQUENT REPORT OF:

WATER SHUT-OFF ☐REPAIRING WELL ☐FRACTURE TREATMENT ☐ALTERING CASING ☐SHOOTING OR ACIDIZING ☐ABANDONMENT* ☐(Other) ☐(NOTE: Report results of multiple completion on Well
Completion or Recompletion Report and Log form.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

Squeeze cement Desert Creek Zone II perforations 5610-50' and Zone III perforations 5651-68' and 5674-83', acidize Zone I with 5000 gallons 28% acid in two stages, return to injection with Desert Creek Zone I perforations 5512-26, 5536-44 and 5552-70' open to injection.

Present injection rate: Shut down 1/10/68.

NOTE: This proposed work is in accordance with Plan of Development of Rutherford Unit as approved by USGS letter of May 29, 1969,

18. I hereby certify that the foregoing is true and correct

SIGNED

C. M. Ebbles

TITLE

District Superintendent

DATE

7-2-69

(This space for Federal or State office use)

APPROVED BY

TITLE

DATE

CONDITIONS OF APPROVAL, IF ANY:

Orig. & 2 cc: USGS, Farmington, NM
2 cc: Utah OAGCC, Salt Lake City
1 cc: Denver
1 cc: File

*See Instructions on Reverse Side

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPlicate (Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-E1424.

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <input checked="" type="checkbox"/> Water Injection Well	5. LEASE DESIGNATION AND SERIAL NO. 14-26-305-352
2. NAME OF OPERATOR Phillips Petroleum Company	6. IF INDIAN ALLOTTEE OR TRIBE NAME Nava jo
3. ADDRESS OF OPERATOR Drawer 1150, Cortez, Colorado 81321	7. UNIT AGREEMENT NAME SM-1-192
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface 510' FNL and 1830' FWL, Sec. 17 NE NW	8. FARM OR LEASE NAME Rutherford Unit
14. PERMIT NO.	9. WELL NO. 17421
15. ELEVATIONS (Show whether DF, RT, GR, etc.) 4749 DF	10. FIELD AND POOL, OR WILDCAT Greater Aneth
	11. SEC., T., R., OR BLK. AND SURVEY OR AREA 17-115-24E SM
	12. COUNTY OR PARISH San Juan
	13. STATE Utah

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF

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☐

PULL OR ALTER CASING

☐
☐
☐
☐
☐

FRACTURE TREAT

MULTIPLE COMPLETE

SHOOT OR ACIDIZE

ABANDON*

REPAIR WELL

CHANGE PLANS

(Other)

SUBSEQUENT REPORT OF:

WATER SHUT-OFF

☐
☐
☐
☐
☐

FRACTURE TREATMENT

SHOOTING OR ACIDIZING

Sqs cut 2-II & III, acidize 2-I, repair 1-I into 2-I
(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

On July 21, 1969, ran Model K C.I. cement retainer, set at 5590'. Squashed Desert Creek Zone II perforations 5610-50 and Zone III perforations 5654-68' and 5674-83' with 250 sx. Class C cement. No holding pressure. WOC 4 hours, squeezed 65 sx. into perforations at holding pressure of 4000#. Acidized Desert Creek Zone I perforations 5512-26, 5536-44 and 5552-70' with 5000 gals. 28% acid in two equal stages separated by 300 gallons salt block. Hooked well up and started injecting water 7-24-69. Hooked well up to high pressure system 7-30-69, resumed injection (had been on low pressure system) into Desert Creek Zone I perforations 5512-26, 5536-44 and 5552-70'.

PREVIOUS INJECTION RATE (Greater Aneth Field, Paradox Formation, Desert Creek Zones I, II, and III) Well shut down since 1/10/68 (well has been on low pressure system - converted to high pressure system on this job).

PRESENT INJECTION RATE: (Greater Aneth, Paradox, Desert Creek Zone I) Injected 161 BWPD at 2500#.

18. I hereby certify that the foregoing is true and correct

SIGNED

C. M. Boles

TITLE

District Superintendent

DATE

8-21-69

(This space for Federal or State office use)

APPROVED BY

TITLE

DATE

CONDITIONS OF APPROVAL, IF ANY:

Orig. & 2 cc: USGS, Farmington, NM
2 cc: Utah O&GCC, Salt Lake City, Utah
1 cc: Denver
1 cc: Superior
1 cc: File

*See Instructions on Reverse Side

STATE OF UTAH
DIVISION OF OIL, GAS, AND MINING
ROOM 4241 STATE OFFICE BUILDING
SALT LAKE CITY, UTAH 84114
(801) 533-5771
(RULE I-5 & RULE I-4)

FORM NO. DOGM-UIC-1
(Revised 1982)

IN THE MATTER OF THE APPLICATION OF
PHILLIPS PETROLEUM COMPANY

CAUSE NO. C-3(B)

ADDRESS P.O. BOX 2920
CASPER, WYOMING ZIP 82602
INDIVIDUAL PARTNERSHIP ☒ CORPORATION
FOR ADMINISTRATIVE APPROVAL TO DISPOSE OR
INJECT FLUID INTO THE 17W21 WELL
SEC. 17 TWP. 41S RANGE 24E
SAN JUAN COUNTY, UTAH

ENHANCED RECOVERY INJ. WELL ☒
DISPOSAL WELL ☐
LP GAS STORAGE ☐
EXISTING WELL (RULE I-4) ☒

APPLICATION

Comes now the applicant and shows the Corporation Commission the following:

1. That Rule I-5 (g) (iv) authorizes administrative approval of enhanced recovery injections, disposal or LP Gas storage operations.
2. That the applicant submits the following information.

Lease Name Ratherford Unit	Well No. 17W21	Field Greater Aneth	County San Juan
Location of Enhanced Recovery Injection or Disposal Well 17W21 Sec. 17 Twp. 41S Rge. 24E			
New Well To Be Drilled Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Old Well To Be Converted Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Casing Test Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Date 5-83	
Depth-Base Lowest Known Fresh Water Within 1/2 Mile Wingate 1550'	Does Injection Zone Contain Oil-Gas-Fresh Water Within 1/2 Mile YES <input checked="" type="checkbox"/> NO <input type="checkbox"/>		State What Oil & Gas
Location of Injection Source(s) Desert Creek Paradox I & II San Juan River	Geologic Name(s) and Depth of Source(s) Desert Creek (5567') San Juan River (Surface)		
Geologic Name of Injection Zone Desert Creek I		Depth of Injection Interval 5512 to 5570	
a. Top of the Perforated Interval: 5512	b. Base of Fresh Water: 1550'	c. Intervening Thickness (a minus b) 3962	
Is the intervening thickness sufficient to show fresh water will be protected without additional data? YES NO See Attachment #4			
Lithology of Intervening Zones See Attachment #1			
Injection Rates and Pressures Maximum 48 (12-82) B/D 2500 PSI			
The Names and Addresses of Those to Whom Notice of Application Should be Sent. Navajo Tribe, Minerals Dept., P.O. Box 146, Window Rock, AZ 86515 Superior Oil, P.O. Box 4530, The Woodlands, TX 77380 Texaco Inc., P.O. Box 2100, Denver, CO 80201 Southland Royalty, 1000 Fort Worth Club Tower, Fort Worth, TX 76102			

State of Wyoming)
County of Natrona)

PHILLIPS PETROLEUM COMPANY

Applicant

Before me, the undersigned authority, on this day personally appeared A. E. Stuart known to me to be the person whose name is subscribed to the above instrument, who being by me duly sworn on oath states, that he is duly authorized to make the above report and that he has knowledge of the facts stated therein, and that said report is true and correct.

Suscribed and sworn to before me this 27th day of Sept, 19 83

SEAL

My commission expires

DONALD L. HUDSON, Notary Public
County of Natrona State of Wyoming
My Commission Expires Nov. 3, 1986
Notary Public in and for Natrona Co., Wyoming
(OVER)

1. Attach qualitative and quantitative analysis of representative sample of water to be injected and a qualitative and quantitative analysis of the injection formation of water.
2. Attach plat showing subject well and all known oil and gas wells, abandoned, drilling and dry holes within one-half mile, together and with the name of the operator(s).
3. Attach Drillers Log (Form DOGM-UIC-2). (Appropriate Surety must be on file with Conservation Division or appropriate government agencies.)
4. Attach Electric or Radioactivity Log of Subject well (if released).
5. Attach schematic drawing of subsurface facilities including; Size, setting depth, amount of cement used measured or calculated tops of cement surface, intermediate (if any) and production casings; size and setting depth of tubing; type and setting depth of packer; geologic name of injection zone showing top and bottom of injection interval.
6. If the application is for a NEW well the original and six (6) copies of the application and three (3) complete sets of attachments shall be mailed to the Division. For EXISTING well applications (Rule I-4) only ONE copy of the application and ONE complete set of attachments are required to be mailed to the Division.
7. The Division is required to send notice of application to the surface owner of the land within one-half mile of the injection well and to each operator of a producing leasehold within one-half mile of the injection well. List all required names and addresses in the appropriate space provided on the front of this form.
8. Notice that an application has been filed shall be published by the Division in a newspaper of general circulation in the county of publication before the application is approved. The notice shall include the name and address of applicant, location of proposed injection or disposal well, injection zone, injection pressure and volume. If no written objection is received within 15 days from date of publication the application may be approved administratively.
9. A well shall not be used for injection or disposal unless completed machine accounting Form DOGM-UIC-3b is filed by January 31st each year.
10. Approval of this application, if granted, is valid only as long as there is no substantial change in the operations set forth in the application. A substantial operation change requires the approval of a new application.
11. If there is less intervening thickness required by Rule I-5 (b) 4, attach sworn evidence and data.
12. For enhanced recovery projects, information required by Rule I-4 which is common to more than one well, need be reported only once on the application.

CASING AND TUBING DATA

NAME OF STRING	SIZE	SETTING DEPTH	SACKS CEMENT	TOP OF CEMENT	TOP DETERMINED BY
Surface	13-3/8	171.5	175	Surface	Returns
Intermediate	8-5/8	1525	603	Surface	Returns
Production	5-1/2	5729	232	4967	CALCULATED
Tubing	2-7/8	5462	Name - Type - Depth of Tubing Packer Baker Loc Set Pkr 5462		
Total Depth 5708	Geologic Name - Inj. Zone Desert Creek I		Depth - Top of Inj. Interval 5512		Depth - Base of Inj. Interval 5570

(To be filed within 30 days after drilling is completed)

14-20-603- 353

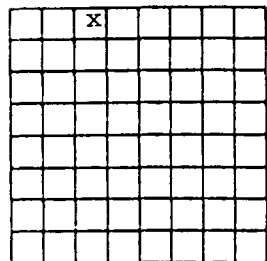
DEPARTMENT OF NATURAL RESOURCES AND ENERGY

LEASE NO.

API NO. 43-037-16416

640 Acres
N

DIVISION OF OIL, GAS, AND MINING
Room 4241 State Office Building
Salt Lake City, Utah 84114



COUNTY San Juan SEC. 17 TWP. 41S RGE. 24E
COMPANY OPERATING Phillips Petroleum Company
OFFICE ADDRESS P.O. Box 2920
TOWN Casper STATE WYoming ZIP 82602
FARM NAME _____ WELL NO. 17W21
DRILLING STARTED 4-24-1958 DRILLING FINISHED 5-15-1958
DATE OF FIRST PRODUCTION 5-19-58 COMPLETED 5-19-58
WELL LOCATED NE 1/4 NW 1/4 _____
510 FT. FROM N OF 1/4 SEC. & 1830 FT. FROM WL OF 1/4 SEC.
ELEVATION BERRICK FLOOR 4749 GROUND 4738

RKB

TYPE COMPLETION

Single Zone X

Multiple Zone _____

Comingled _____

LOCATION EXCEPTION

OIL OR GAS ZONES

Name	From	To	Name	From	To
Desert Creek I	5512	5570			
Desert Creek II	5610	5650			
Desert Creek III	5654	5668			

CASING & CEMENT

Casing Set				Csg. Test	Cement		
Size	Wgt.	Grade	Feet	Psi	Sax	Fillup	Top
13-3/8	27.1	H-40	162	500	175		surface
8-5/8	24	J-55	1543	500	603		surface
5-1/2	14	J-55	5608	500	232	700	4967
	15.5	J-55	148				

TOTAL DEPTH 5708

PACKERS SET Baker Loc-set @ 5462
DEPTH _____

NOTE: THIS FORM MUST ALSO BE ATTACHED WHEN FILING PLUGGING FORM DOGM-UIC-6

COMPLETION & TEST DATA BY PRODUCING FORMATION

FORMATION	Desert Creek <u>I</u>		
SPACING & SPACING ORDER NO.	40 acre Cause #C-3(B)		
CLASSIFICATION (DISPOSAL WELL, ENHANCED RECOVERY, LP GAS STORAGE)	Enhanced Recovery		
PERFORATED	5512-26		
INTERVALS	5536-44		
	5552-70		
ACIDIZED?	7-21-69 5000 gal 28% Acid		
FRACTURE TREATED?	No		

INITIAL TEST DATA

Converted to Injector 7-20-69

Date	7-21-69		
Oil, bbl./day	--		
Oil Gravity	--		
Gas, Cu. Ft./day	-- CF	CF	CF
Gas-Oil Ratio Cu. Ft./Bbl.	--		
Water-Bbl./day	161		
Pumping or Flowing	pumping		
CHOKE SIZE	----		
FLOW TUBING PRESSURE	2500		

A record of the formations drilled through, and pertinent remarks are presented on the reverse.
(use reverse side)

I, the undersigned, being first duly sworn upon oath, state that this well record is true, correct and complete according to the records of this office and to the best of my knowledge and belief.

Telephone 307-237-3791

A.E. Stuart, Area Manager

Name and title of representative of company

Subscribed and sworn before me this _____ day of SEP 22 '83 19 83

Casper

WELL: 17W21
LOCATION: NENW Sec 17-41S-24E
FIELD: GREATER ANGELO
RESERVOIR: Desert Creek I

I COMPLETION: 7.21.69
PRESENT STATUS: W. I.

RKB 4749'
GL 4738'

SURFACE CASING: 13 3/8" 27.1#
H-40

INTERMEDIATE CASING: 8 5/8"
24# J-55

PRODUCTION CASING: 5 1/2" 14#
J-55 5608', 15.5# J-55
148'

PERFORATIONS: _____

5512-26

5536-44

5552-70

PACKER: Baker Loc-set
pk @ 5462'

Tubing: 2 7/8" @ 5462'

5462'

5512' - 5570'

PBTD: 5708'

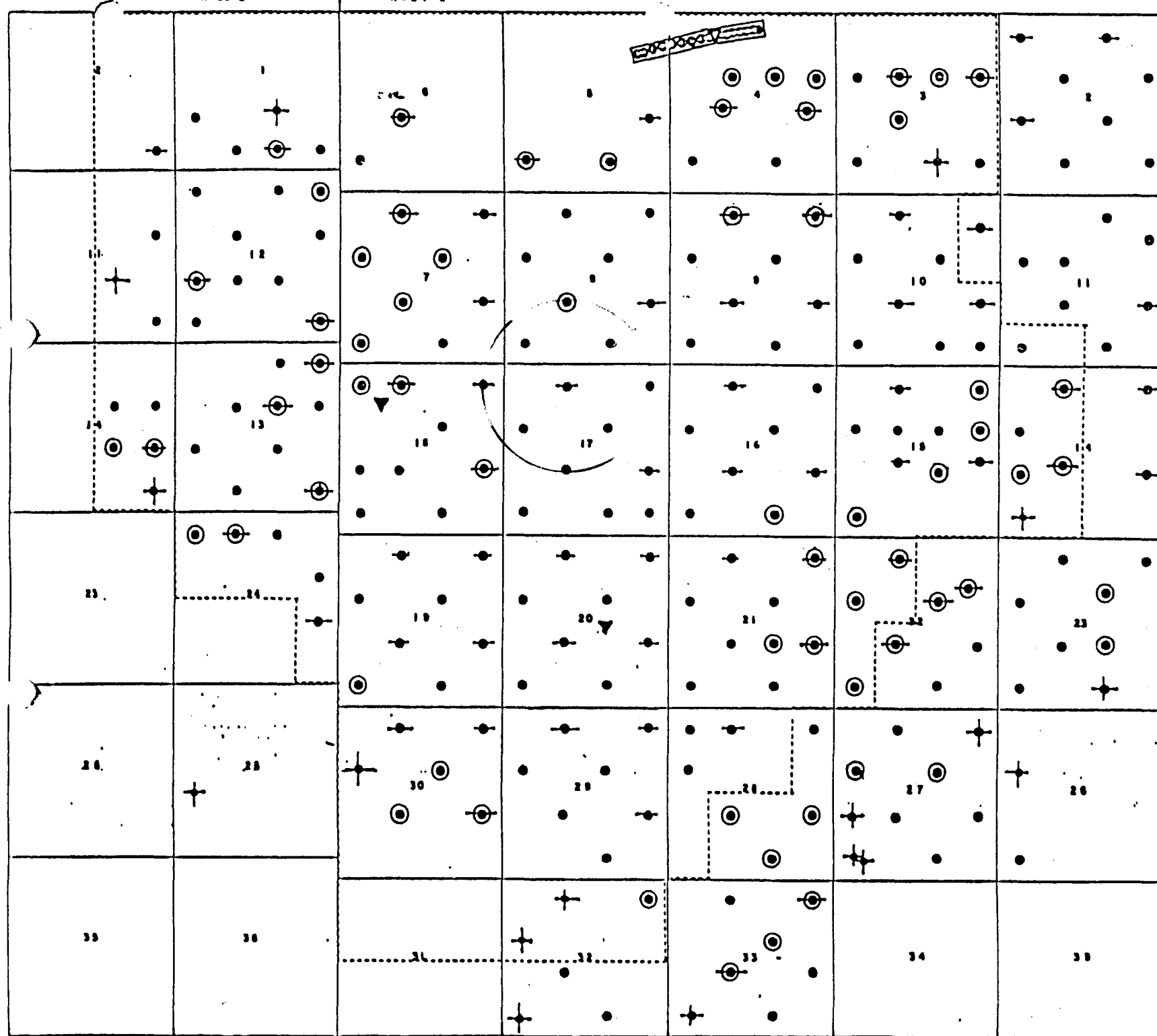
OTD: 5729'

5729'

Phillips Petroleum Company

R-23-E

R-24-E



RATHERFORD UNIT
 SAN JUAN COUNTY, UTAH
 2" = 1 mile
 RCT 3-83

● oil producer
 — water injector
 ⊕ water supply
 ▼ domestic water
 + plugged & abandoned
 ○ shut in well
 -- unit boundary

CHECKLIST FOR INJECTION WELL APPLICATION AND FILE REVIEW

Operator: Phillips Well No. Rutherford Unit 17W21
 County: San Juan T 41S R 24E Sec. 17 API# 43-032-16414
 New Well ☐ Conversion ☐ Disposal Well ☐ Enhanced Recovery Well ☒

	YES	NO
UID Forms Completed	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Plat including Surface Owners, Leaseholders, and wells of available record	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Schematic Diagram	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Fracture Information	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Pressure and Rate Control	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Adequate Geologic Information	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Fluid Source

Desert Creek

Analysis of Injection Fluid	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	TDS <u>85655</u>
Analysis of Water in Formation to be injected into	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	TDS <u>103633</u>

Known USDW in area

Wingate Depth 1550

Number of wells in area of review

8 Prod. 7 P&A 0

Water 0 Inj. 1

Aquifer Exemption

Yes ☐ NA ☒

Mechanical Integrity Test

Yes ☐ No ☒

Date _____ Type _____

Comments: TO C 4967

Reviewed by: 

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Budget Bureau No. 1004-0135
Expires August 31, 1985

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals.)

1. <input type="checkbox"/> OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER Water Injection Well		5. LEASE DESIGNATION AND SERIAL NO. 14-20-603-353
2. NAME OF OPERATOR Phillips Petroleum Company		6. IF INDIAN, ALLOTTEE OR TRIBE NAME Navajo
3. ADDRESS OF OPERATOR P.O. Box 2920, Casper, Wyoming 82602		7. UNIT ASSIGNMENT NAME SW-I-4192
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface 510' FNL & 1830' FWL, NE NW		8. FARM OR LEASE NAME Ratherford Unit
14. PERMIT NO. API #43-037-16416		9. WELL NO. 17W21
15. ELEVATIONS (Show whether DF, HT, GR, etc.) RKB 4751'		10. FIELD AND POOL, OR WILDCAT Greater Aneth
		11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA Sec. 17-T41S-R24E
		12. COUNTY OR PARISH San Juan
		13. STATE Utah

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF	<input type="checkbox"/>	PULL OR ALTER CASING	<input type="checkbox"/>
FRACTURE TREAT	<input type="checkbox"/>	MULTIPLE COMPLETE	<input type="checkbox"/>
SHOOT OR ACIDIZE	<input type="checkbox"/>	ABANDON*	<input type="checkbox"/>
REPAIR WELL	<input type="checkbox"/>	CHANGE PLANE	<input type="checkbox"/>
(Other)	<input type="checkbox"/>		<input type="checkbox"/>

SUBSEQUENT REPORT OF:

WATER SHUT-OFF	<input type="checkbox"/>	REPAIRING WELL	<input type="checkbox"/>
FRACTURE TREATMENT	<input type="checkbox"/>	ALTERING CASING	<input type="checkbox"/>
SHOOTING OR ACIDIZING	<input checked="" type="checkbox"/>	ABANDONMENT*	<input type="checkbox"/>
(Other)	<input type="checkbox"/>		<input type="checkbox"/>

(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

August 31, 1985 through September 30, 1985

Acidized w/2400 gal 28% Acid & returned to injection 9/6/85 with a final test run 9/30/85.

Injection Rate Before - 48 BWPd at 2375 psi
Injection Rate After - 64 BWPd at 2500 psi

RECEIVED

NOV 01 1985

DIVISION OF OIL
GAS & MINING

5 - BLM, Farmington, NM
2 - Utah O&G CC, Salt Lake City, UT
1 - R. Ewing, B'Ville
1 - L. Williamson, Denver
1 - File (RC)

18. I hereby certify that the foregoing is true and correct

SIGNED D. C. Gill D. C. Gill TITLE Area Manager DATE 10/29/85

(This space for Federal or State office use)

APPROVED BY UIC Manager TITLE UIC Manager DATE 11-8-85
CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

UTAH DIVISION OF OIL, GAS AND MINING
CASING-BRADENHEAD TEST

OPERATOR: Phillips Petroleum
FIELD: Greater Aneth LEASE: Rutherford
WELL # 17W21 SEC. 17 TOWNSHIP 41S RANGE 24E
STATE FED. FEE DEPTH 5708 TYPE WELL INJW MAX. INJ. PRESS. 2500

TEST DATE 6/17/86

CASING STRING	SIZE	SET AT	CMT	PRESSURE READINGS	REMARKS	FUTURE
<u>SURFACE</u>	<u>13³/₈</u>	<u>171</u>	<u>175</u>			
<u>INTERMEDIATE</u>	<u>8⁵/₈</u>	<u>1525</u>	<u>603</u>			
<u>PRODUCTION</u>	<u>5¹/₂</u>	<u>5729</u>	<u>232</u>	<u>2680</u>	<u>LEAK</u>	<u>Work over</u>
<u>TUBING</u>	<u>2⁷/₈</u>	<u>5462</u>		<u>2680</u> <u>Baker</u>	<u>Packer</u>	

CASING STRING	SIZE	SET AT	CMT	PRESSURE READINGS	REMARKS	FUTURE
<u>SURFACE</u>						
<u>INTERMEDIATE</u>						
<u>PRODUCTION</u>						
<u>TUBING</u>						

CASING STRING	SIZE	SET AT	CMT	PRESSURE READINGS	REMARKS	FUTURE
<u>SURFACE</u>						
<u>INTERMEDIATE</u>						
<u>PRODUCTION</u>						
<u>TUBING</u>						

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPLICATE
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 1004-0135
Expires August 31, 1985

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals.)

1. OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <input type="checkbox"/> Water Injection		3. LEASE DESIGNATION AND SERIAL NO. 14-20-603-353	
2. NAME OF OPERATOR Phillips Petroleum Company		6. IF INDIAN, ALLOTTEE OR TRIBE NAME Navajo	
3. ADDRESS OF OPERATOR P. O. Box 1150, Cortez, CO 81321		7. UNIT AGREEMENT NAME SW-I-4192	
4. LOCATION OF WELL (Report location clearly and in accordance with any State regulations. See also space 17 below.) At surface 510' FNL & 1830' FWL		8. FARM OR LEASE NAME Ratherford Unit	
14. PERMIT NO. 43-037-16416		9. WELL NO. #17W21	
15. ELEVATIONS (Show whether DF, RT, GR, etc.) 4749' GL		10. FIELD AND POOL, OR WILDCAT Greater Aneth	
		11. SEC., T., R., M., OR S.E. AND SURVEY OR AREA Sec. 17, T41S, R24E	
		12. COUNTY OR PARISH San Juan	
		13. STATE Utah	

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF	<input type="checkbox"/>	PULL OR ALTER CASING	<input type="checkbox"/>
FRACTURE TREAT	<input type="checkbox"/>	MULTIPLE COMPLETE	<input type="checkbox"/>
SHOOT OR ACIDIZE	<input type="checkbox"/>	ABANDON*	<input type="checkbox"/>
REPAIR WELL	<input type="checkbox"/>	CHANGE PLANS	<input type="checkbox"/>
(Other)	<input type="checkbox"/>		<input type="checkbox"/>

SUBSEQUENT REPORT OF:

WATER SHUT-OFF	<input type="checkbox"/>	REPAIRING WELL	<input type="checkbox"/>
FRACTURE TREATMENT	<input type="checkbox"/>	ALTERING CASING	<input type="checkbox"/>
SHOOTING OR ACIDIZING	<input type="checkbox"/>	ABANDONMENT*	<input type="checkbox"/>
(Other)	<input checked="" type="checkbox"/> Replace injection tubing		<input checked="" type="checkbox"/>

(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.) *

March 23, 1988 through March 26, 1988

Move in Well Service Unit 3/23/88. Release packer and COOH laying down. Tubing liner failure apparent upon visual inspection. RIH with 2-7/8" workstring open-ended, clean out hole, POOH, RIH with bit and scraper and clean out to 5563'. POOH and shut down. Rig down and Move out.

April 14, 1988 through April 16, 1988

Move in Well Service unit 4/14/88. PU packer and RIH on 2-7/8" rice Duoline 20 tubing. Hydrotest tubing while going in hole. Set packer at 5413'. Pressure test annulus for UIC to 1000 psi. Tested ok. Return well to injection. Release rig 4/16/88. Rig down, Move off.

Injection Before: 11 BWPD

Injection After: 70 BWPD

4-BLM

2-Utah O&G

1-M. Williams, Bartlesville

1-R. J. Rundt (r) Engineering

1-D. C. Gill (r) Denver Files

1-Cortez Office - RC

18. I hereby certify that the foregoing is true and correct

SIGNED

J. Reno

TITLE District Superintendent

DATE

5/18/88

(This space for Federal or State office use)

APPROVED BY

TITLE

DATE

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

42 181	50 SHEETS	5 SQUARE
42 182	100 SHEETS	5 SQUARE
42 189	200 SHEETS	5 SQUARE

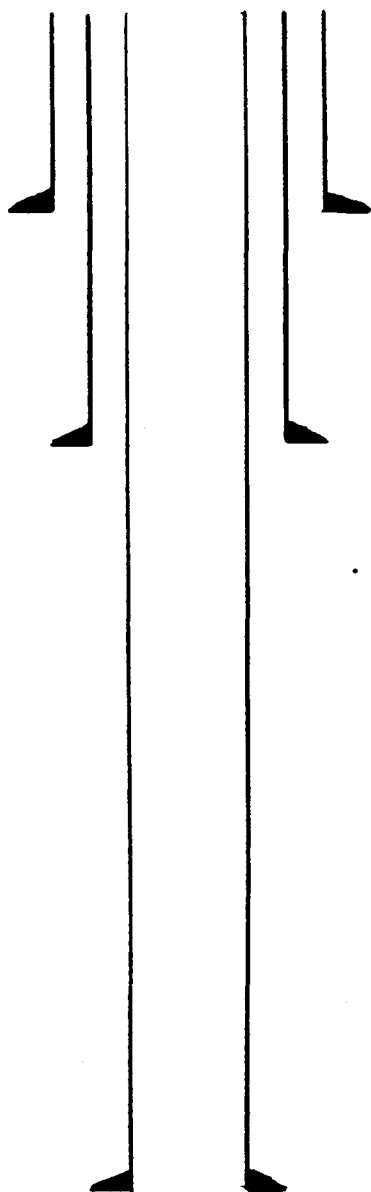
42 181	50 SHEETS	5 SQUARE
42 182	100 SHEETS	5 SQUARE
42 189	200 SHEETS	5 SQUARE

Locations SW NW sec. 17

T41S-R24E

Well Drld 2/2/58

Well converted
to injector 12/9/86



SURFACE CSG. 8⁵/₈ @ 1540'

Tubing $2\frac{3}{8}$ " @ 5,690' Duoline HT2

PERFS 5520 - 36 _____ - _____
5544 - 61 _____ - _____
5570 - 77 _____ - _____
 _____ - _____

PRODUCTION Csg. $\frac{5\frac{1}{2} @ 5730}{J-55 \quad 14\frac{1}{2} \quad 13.5\frac{1}{2}}$

All Perfs Zone I unless noted

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Budget Bureau No. 1004-0135
Expires August 31, 1985

SUNDRY NOTICES AND REPORTS ON WELLS

(Do not use this form for proposals to drill or to deepen or plug back to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals.)

1. <input type="checkbox"/> OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER WATER INJECTION & WATER SUPPLY WELLS		6. IF INDIAN, ALLOTTEE OR TRIBE NAME SW-I-4192	
2. NAME OF OPERATOR PHILLIPS PETROLEUM COMPANY		7. UNIT AGREEMENT NAME RATHERFORD UNIT #7960041920	
3. ADDRESS OF OPERATOR 152 N. DURBIN, 2ND FLOOR, CASPER, WYOMING 82601		8. FARM OR LEASE NAME	
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface <u>SEE ATTACHED</u>		9. WELL NO. VARIOUS (see attached)	
14. PERMIT NO.		10. FIELD AND POOL, OR WILDCAT GREATER ANETH	
15. ELEVATIONS (Show whether DF, BT, OR, etc.) OIL, GAS & MINING		11. SEC., T., R., N., OR BLK. AND SURVEY OR AREA Sections 1 thru 30 T41S - R23E & 24E	
		12. COUNTY OR PARISH	13. STATE San Juan Utah

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:		SUBSEQUENT REPORT OF:	
TEST WATER SHUT-OFF <input type="checkbox"/>	PULL OR ALTER CASING <input type="checkbox"/>	WATER SHUT-OFF <input type="checkbox"/>	REPAIRING WELL <input type="checkbox"/>
FRACTURE TREAT <input type="checkbox"/>	MULTIPLE COMPLETE <input type="checkbox"/>	FRACTURE TREATMENT <input type="checkbox"/>	ALTERING CASING <input type="checkbox"/>
SHOOT OR ACIDIZE <input type="checkbox"/>	ABANDON* <input type="checkbox"/>	SHOOTING OR ACIDIZING <input type="checkbox"/>	ABANDONMENT* <input type="checkbox"/>
REPAIR WELL <input type="checkbox"/>	CHANGE PLANS <input type="checkbox"/>	(Other) <u>CHANGE OF OWNERSHIP</u> <input checked="" type="checkbox"/>	
(Other) <input type="checkbox"/>		(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)	

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

This is to advise all Water Injection and Water Supply Wells on the Ratherford Unit, listed on the attached sheet, were sold to Phillips Petroleum Company, effective August 1, 1985.

(former Operator - Phillips Oil Company)

3 - BLM, Farmington, NM
2 - Utah O&G CC, SLC, UT
1 - File

18. I hereby certify that the foregoing is true and correct

SIGNED S. H. Oden TITLE District Superintendent DATE March 17, 1989

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

MONTHLY OIL AND GAS PRODUCTION REPORT

OPERATOR NAME AND ADDRESS:

P J KONKEL
PHILLIPS PETROLEUM COMPANY
5525 HWY 64 NBU 3004
FARMINGTON NM 87401

RECEIVED

AUG 16 1993

ACCOUNT NUMBER: N0772

REPORT PERIOD (MONTH/YEAR):

6 / 93

DIVISION OF
OIL, GAS & MININGAMENDED REPORT ☐ (Highlight Changes)

Well Name			Producing Zone	Well Status	Days Oper	Production Volumes		
API Number	Entity	Location				OIL(BBL)	GAS(MCF)	WATER(BBL)
#21-23								
4303713754	06280	41S 24E 21	DSCR	POW	29	1374	883	58
#3-44								
4303715031	06280	41S 24E 3	DSCR	POW	30	111	94	2905
#3-14								
4303715124	06280	41S 24E 3	DSCR	POW	30	67	23	302
#9-12								
4303715126	06280	41S 24E 9	DSCR	POW	30	112	654	17363
#9-14								
4303715127	06280	41S 24E 9	DSCR	POW	30	201	315	423
#28-12								
4303715336	06280	41S 24E 28	PRDX	POW	29	112	47	2428
#29-12								
4303715337	06280	41S 24E 29	PRDX	POW	29	56	0	672
#29-32								
4303715339	06280	41S 24E 29	DSCR	POW	29	1402	287	2224
#29-34								
4303715340	06280	41S 24E 29	DSCR	POW	29	757	48	0
#30-32								
4303715342	06280	41S 24E 30	DSCR	POW	29	588	1049	3744
#3-12								
4303715620	06280	41S 24E 3	DSCR	POW	30	268	11	363
#9-34								
4303715711	06280	41S 24E 9	DSCR	POW	30	45	46	9800
#10-12								
4303715712	06280	41S 24E 10	DSCR	POW	30	45	23	1088
TOTALS						5138	3480	41370

COMMENTS: Effective July 1, 1993, Phillips Petroleum Company has sold its interest in the
Ratherford Unit to Mobil Exploration and Producing U.S., Incorporated, P. O. Box
633, Midland, Texas 79702. Mobil assumed operations on July 1, 1993.

I hereby certify that this report is true and complete to the best of my knowledge.

Date: 8/11/93

Name and Signature: PAT KONKEL

Pat Konkell

Telephone Number: 505 599-3452

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING

Page 1 of 1

MONTHLY OIL AND GAS DISPOSITION REPORT

OPERATOR NAME AND ADDRESS:

L B Sheffield~~BRIAN BERRY~~~~M E P N A MOBIL~~~~POB 219031 1807A RENTWY~~ *P.O. DRAWER G*~~DALLAS TX 75221-9031~~ *CORTEZ, CO. 81321*UTAH ACCOUNT NUMBER: N7370REPORT PERIOD (MONTH/YEAR): 7 / 93AMENDED REPORT ☐ (Highlight Changes)**931006 updated.
Jie*

ENTITY NUMBER	PRODUCT	GRAVITY	BEGINNING INVENTORY	VOLUME PRODUCED	DISPOSITIONS				ENDING INVENTORY
		BTU			TRANSPORTED	USED ON SITE	FLARED/VENTED	OTHER	
05980	OIL			177609	177609	0			
	GAS			72101	66216	5885			
11174	OIL								
	GAS								
	OIL								
	GAS								
	OIL								
	GAS								
	OIL								
	GAS								
	OIL								
	GAS								
	OIL								
	GAS								
	OIL								
	GAS								
TOTALS				249710	243925	5885			

COMMENTS:

*PLEASE NOTE ADDRESS change. Robin ~~also~~ production Reports
will be compiled and sent from the Cortez, Co. office
IN THE FUTURE.*

I hereby certify that this report is true and complete to the best of my knowledge.

Name and Signature:

Lwell B Sheffield

Date:

9/5/93

Telephone Number:

*303 565 2212
244 658 2528*

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING

SUNDRY NOTICES AND REPORTS ON WELLS (Do not use this form for proposals to drill or to deepen or plug back to a different reservoir. Use "APPLICATION FOR PERMIT—" for such proposals.)		5. LEASE DESIGNATION & SERIAL NO. 6. IF INDIAN, ALLOTTEE OR TRIBE NAME NAVAJO TRIBAL	
1. <input type="checkbox"/> OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER		7. UNIT AGREEMENT NAME RATHERFORD UNIT	
2. NAME OF OPERATOR MOBIL OIL CORPORATION		8. FARM OR LEASE NAME	
3. ADDRESS OF OPERATOR P. O. BOX 633 MIDLAND, TX 79702		9. WELL NO.	
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements. See also space 17 below.) At surface At proposed prod. zone		10. FIELD AND POOL, OR WILDCAT GREATER ANETH	
14. API NO.		15. ELEVATIONS (Show whether DF, RT, GR, etc.)	
12. COUNTY SAN JUAN		13. STATE UTAH	

16.

Check Appropriate Box To Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:

TEST WATER SHUT-OFF ☐FRACTURE TREAT ☐SHOOT OR ACIDIZE ☐REPAIR WELL ☐(Other) ☐PULL OR ALTER CASING ☐MULTIPLE COMPLETE ☐ABANDON ☐CHANGE PLANS ☐

APPROX. DATE WORK WILL START _____

SUBSEQUENT REPORT OF:

WATER SHUT-OFF ☐FRACTURE TREATMENT ☐SHOOTING OR ACIDIZING ☐(Other) ☐ CHANGE OF OPERATOR

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

REPAIRING WELL ☐ALTERING CASING ☐ABANDONMENT* ☐

DATE OF COMPLETION _____

17. DESCRIBE PROPOSED OR COMPLETED OPERATIONS (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)

* Must be accompanied by a cement verification report.

AS OF JULY1, 1993, MOBIL OIL CORPORATION IS THE OPERATOR OF THE RATHERFORD UNIT.
 ATTACHED ARE THE INDIVIDUAL WELLS.

18. I hereby certify that the foregoing is true and correct.

SIGNED

Shirley Todd

TITLE

ENV. & REG TECHNICIAN

DATE

9-8-93

(This space for Federal or State office use)

APPROVED BY _____

TITLE _____

DATE _____

CONDITIONS OF APPROVAL, IF ANY:

See Instructions On Reverse Side

✓ 12W-44	43-037-16405	14-20-603-246A	SEC. 12, T41S, R23E	SE/SE 660 FSL; 660 FEL	PA'd
✓ 12W-44A	43-037-31543	14-20-603-246A	SEC. 12, T41S, R23E	SE/SE 807 FEL; 772 FSL	
✓ 13-11W	43-037-31152	14-20-603-247A	SEC. 13, T41S, R23E	NW/NW 500 FNL; 660 FWL	
✓ 13-12	43-037-31127	14-20-603-247A	SEC. 13, T41S, R23E	SW/NW 1705 FNL; 640 FWL	
✓ 13W-13	43-037-15851	14-20-603-247A	SEC. 13, T41S, R23E	NW/SW 1980 FSL; 4620 FEL	
✓ 13-14	43-037-31589	14-20-603-247A	SEC. 13, T41S, R23E	660 FSL; 660 FWL	
✓ 13-21	43-037-31128	14-20-603-247A	SEC. 13, T41S, R23E	NE/NW 660 FNL; 1920 FWL	
✓ 13W-22	43-037-15852	14-20-603-247A	SEC. 13, T41S, R23E	SE/NW 1988 FNL; 3300 FEL	
✓ 13-23	43-037-31129	14-20-603-247A	SEC. 13, T41S, R23E	NE/SW 1980 FSL; 1930 FWL	
✓ 13W-44	43-037-15853	14-20-603-247	SEC. 13, T41S, R23E	600 FSL; 3300 FEL	
✓ 13W-32	43-037-16406	14-20-603-247A	SEC. 13, T41S, R23E	1881 FNL; 1979 FEL	
✓ 13W-33	43-037-15855	14-20-603-247A	SEC. 13, T41S, R23E	NW/SE 1970 FSL; 1979 FEL	
✓ 13W-34	43-037-31130	14-20-603-247A	SEC. 13, T41S, R23E	SW/SE 660 FSL; 1980 FEL	
✓ 13-41	43-037-15856	14-20-603-247A	SEC. 13, T41S, R23E	NE/NE 660 FNL; 660 FEL	
✓ 13W-42	43-037-15857	14-20-603-247A	SEC. 13, T41S, R23E	SE/NE 2139; 585 FEL	
✓ 13-43	43-037-31131	14-20-603-247A	SEC. 13, T41S, R23E	NE/SE 1700 FSL; 960 FEL	
✓ 13W-44	43-037-16407	14-20-603-247A	SEC. 13, T41S, R23E	SE/SE 635 FSL; 659 FEL	
✓ 14-03	NA	14-20-603-4037	SEC. 14, T41S, R23E	SW/SW 660 FSL; 660 FEL	
✓ 14-32	43-037-15858	14-20-603-247A	SEC. 14, T41S, R23E	2130 FNL; 1830 FEL	
✓ 14-41	43-037-31623	14-20-603-247A	SEC. 14, T41S, R23E	NE/NE 521 FEL; 810 FNL	
✓ 14W-42	43-037-15860	14-20-603-247A	SEC. 14, T41S, R23E	SE/NE 1976 FNL; 653 FEL	
✓ 14W-43	43-037-16410	14-20-603-247A	SEC. 14, T41S, R23E	3300 FSL; 4770 FEL	
✓ 14-33	43-037-15859	14-20-603-247	SEC. 14, T41S, R23E	2130 FSL; 1830 FEL	
✓ 15-12	43-037-15715	14-20-603-355	SEC. 15, T41S, R24E	1820 FNL; 500 FWL	
✓ 15W-21	43-037-16411	14-20-603-355	SEC. 15, T41S, R24E	660 FNL; 1820 FWL	
✓ 15-22	43-037-30449	14-20-603-355	SEC. 15, T41S, R24E	SE/NW, 1980 FNL; 2050 FWL	
✓ 15-32	43-037-15717	14-20-603-355A	SEC. 15, T41S, R24E	1980 FNL; 1980 FEL	
✓ 15-33	43-037-15718	14-20-603-355	SEC. 15, T41S, R24E	NW/SE 1650 FSL; 1980 FEL	
✓ 15-41	43-037-15719	14-20-603-355	SEC. 15, T41S, R24E	660 FNL; 660' FEL	
✓ 15-42	43-037-30449	14-20-603-355	SEC. 15, T41S, R24E	SE/NE 2020 FNL; 820 FEL	
✓ 16W-12	43-037-15720	14-20-603-355	SEC. 16, T41S, R24E	SW/NW 1880 FNL; 660 FWL	
✓ 16-13	43-037-31168	14-20-603-355	SEC. 16, T41S, R24E	1980 FSL; 660 FWL	
✓ 16W-14	43-037-15721	14-20-603-355	SEC. 16, T41S, R24E	SW/SW 660 FSL; 660 FWL	
✓ 16W-21	43-037-16414	14-20-603-355	SEC. 16, T41S, R24E	NE/NW 660 FNL; 1880 FWL	
✓ 16W-23	43-037-15722	14-20-603-355	SEC. 16, T41S, R24E	NE/SW 1980 FSL; 1980 FWL	
✓ 16-32	43-037-15723	14-20-603-355	SEC. 16, T41S, R24E	1980 FNL; 1980' FEL	
✓ 16-34	43-037-15724	14-20-603-355	SEC. 16, T41S, R24E	660 FNL; 1980' FEL	
✓ 16-41	43-037-15725	14-20-603-355	SEC. 16, T41S, R24E	660 FNL; 660 FEL	
✓ 16W-43	43-037-16415	14-20-603-355	SEC. 16, T41S, R24E	NE/SE 2140 FSL; 820 FEL	
✓ 17-11	43-037-31169	14-20-603-353	SEC. 17, T41S, R24E	NW/NW 1075' FNL; 800' FWL	
✓ 17W-12	43-037-15726	14-20-603-353	SEC. 17, T41S, R24E	SW/NW 1980' FNL; 510' FWL	
✓ 17-13	43-037-31133	14-20-603-353	SEC. 17, T41S, R24E	NW/SW 2100' FSL; 660' FWL	
✓ 17W-14	43-037-15727	14-20-603-353	SEC. 17, T41S, R24E	SW/SW 660' FSL; 660' FWL	
* ✓ 17W-21	43-037-16416	14-20-603-353	SEC. 17, T41S, R24E	510' FNL; 1830' FWL	
✓ 17-22	43-037-31170	14-20-603-353	SEC. 17, T41S, R24E	1980' FNL; 1980' FWL	
✓ 17W-23	43-037-15728	14-20-603-353	SEC. 17, T41S, R24E	NE/SW 1980' FWL; 1880' FSL	
✓ 17-31	43-037-31178	14-20-603-353	SEC. 17, T41S, R24E	NW/NE 500' FNL; 1980' FEL	
✓ 17-32W	43-037-15729	14-20-603-353	SEC. 17, T41S, R24E	SW/NE 1830' FNL; 2030' FEL	
✓ 17-33	43-037-31134	14-20-603-353	SEC. 17, T41S, R24E	NW/SE 1980' FSL; 1845' FEL	
✓ 17-34W	43-037-15730	14-20-603-353	SEC. 17, T41S, R24E	SW/SE 560' FSL; 1880' FEL	
✓ 17W-41	43-037-15731	14-20-603-353	SEC. 17, T41S, R24E	610' FNL; 510' FEL	
✓ 17-42	43-037-31177	14-20-603-353	SEC. 17, T41S, R24E	SE/NE 1980; FNL, 660' FEL	
✓ 17-44	43-037-15732	14-20-603-353	SEC. 17, T41S, R24E	660 FSL; 660' FEL	
✓ 17W-43	43-037-16417	14-20-603-353	SEC. 17, T41S, R24E	NE/SE 1980' FSL; 660' FEL	
✓ 18-11	43-037-15733	14-20-603-353	SEC. 18, T41S, R24E	NW/NW 720' FNL; 730' FWL	
✓ 18-12W	43-037-31153	14-20-603-353	SEC. 18, T41S, R24E	SW/NW 1980' FNL; 560' FWL	
✓ 18W-21	43-037-16418	14-20-603-353	SEC. 18, T41S, R24E	NE/NW 660' FNL; 1882' FWL	
✓ 18-22	43-037-31236	14-20-603-353	SEC. 18, T41S, R24E	SW/NW 2200' FNL; 2210' FWL	
✓ 18W-23	43-037-30244	14-20-603-353	SEC. 18, T41S, R24E	NE/SW 2385' FSL; 2040' FWL	
✓ 18W-14	43-037-15735	14-20-603-353	SEC. 18, T41S, R24E	SW/SW 810' FSL; 600' FWL	
✓ 18-24	43-037-31079	14-20-603-353	SEC. 18, T41S, R24E	SE/SW 760' FSL; 1980' FWL	
✓ 18-31	43-037-31181	14-20-603-353	SEC. 18, T41S, R24E	NW/NE 795' FNL; 2090; FEL	
✓ 18W-32	43-037-15736	14-20-603-353	SEC. 18, T41S, R24E	SW/NE 2140' FNL; 1830' FEL	
✓ 18-33	43-037-31135	14-20-603-353	SEC. 18, T41S, R24E	NW/SE 1870' FSL; 1980' FEL	
✓ 18-34W	43-037-15737	14-20-603-353	SEC. 18, T41S, R24E	SW/SE 780' FSL; 1860 FEL	
✓ 18W-41	43-037-15738	14-20-603-353	SEC. 18, T41S, R24E	NE/NE 660' FNL; 660' FEL	
✓ 18-42	43-037-31182	14-20-603-353	SEC. 18, T41S, R24E	SE/NE 2120' FNL; 745' FEL	
✓ 18W-43	43-037-16419	14-20-603-353	SEC. 18, T41S, R24E	NE/SE 1980' FSL; 660' FEL	PA'd
✓ 18-44	43-037-31045	14-20-603-353	SEC. 18, T41S, R24E	SE/SE 660' FSL; 660' FEL	
✓ 19-11	43-037-31080	14-20-603-353	SEC. 19, T41S, R24E	NW/NW 660' FNL; 660' FWL	
✓ 19-12	43-037-15739	14-20-603-353	SEC. 19, T41S, R24E	600' FWL; 1980' FNL	
✓ 19-14	43-037-15740	14-20-603-353	SEC. 19, T41S, R24E	600' FSL; 660' FEL	

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS OF

Do not use this form for proposals to drill or to deepen or to enter to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals.

SUBMIT IN TRIPLICATE

DIVISION OF
OIL, GAS & MINING

1. Type of Well
☐ Oil Well ☐ Gas Well ☒ Other INJECTION WELL

2. Name of Operator
MOBIL EXPLORATION & PRODUCING US AS AGENT FOR MPTM/MEPNA

3. Address and Telephone No.
P O BOX 633 MIDLAND, TX 79702 (915) 688-2585

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
SEC. 17, T41S, R24E
510' FNL; 1830' FWL

5. Lease Designation and Serial No.
14-20-603-353

6. If Indian, Allottee or Tribe Name
NAVAJO TRIBAL

7. If Unit or CA, Agreement Designation
RATHERFORD UNIT

8. Well Name and No.
17W-21

9. API Well No.
43-037-16416

10. Field and Pool, or Exploratory Area
GREATER ANETH

11. County or Parish, State
SAN JUAN, UTAH

12. CHECK APPROPRIATE BOX(S) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Abandonment
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Recompletion
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Plugging Back
	<input type="checkbox"/> Casing Repair
	<input type="checkbox"/> Altering Casing
	<input type="checkbox"/> Other NON-COMPLIANCE INJ. WELL PROCEDURES IF NEEDED
	<input type="checkbox"/> Change of Plans
	<input type="checkbox"/> New Construction
	<input type="checkbox"/> Non-Routine Fracturing
	<input type="checkbox"/> Water Shut-Off
	<input type="checkbox"/> Conversion to Injection
	<input type="checkbox"/> Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*
SEE ATTACHMENT

RECEIVED - THE BUREAU OF LAND MANAGEMENT
SEP 20 1993
DATE 9-20-93
BY [Signature]

14. I hereby certify that the foregoing is true and correct

Signed Shirley Todd SHIRLEY TODD

Title ENV. & REG TECHNICIAN

Date 9-13-93

(This space for Federal or State office use)

Approved by _____
Conditions of approval, if any:

Title _____

Date _____

RATHERFORD 17-21
ELIMINATE BACKSIDE PRESSURE
TOM COCHRANE 303 565-2210

CHARGE WORKOVER TO 7332-17679

*** HISTORY INDICATES NO OOT, BUT I SUSPECT THERE IS ONE IN THE HOLE AND IT IS THE SOURCE OF OUR BS PRESSURE.

1. BLEED WELL DOWN AS MUCH AS POSSIBLE. LESS WATER HAULED MEANS LESS MONEY SPENT. ND WH, NU BOP. UNSET PKR & POH W/INJ TBG, OOT, & PKR. LAY DOWN OOT, IT WILL NOT BE RUN BACK IN HOLE. REDRESS LOK-SET PKR.

DRILLING FOREMAN EVALUATE CONDITION OF DUOLINE TUBING AND SEALS, DISCUSS W/PROD FMN & ENGR IF MODIFICATIONS NEEDED BEFORE RUNNING INJ TBG AGAIN. RE-RUN WITH HP SEALS, ADVISE DUOLINE ASAP IF NEED MORE SEALS THAN WE HAVE ON HAND.

*** STEP 2 IS NEXT, BECAUSE THE PRESSURE ON THE BS IS PROBABLY DUE TO A LEAK (OOT, PKR, TBG CONNECTION).

2. GIH W/LOK-SET IPC PKR AND INJ TBG AS FROM BEFORE WO, OR AS PER ED BARBER'S (PRODUCTION FOREMAN'S) RECOMMENDATION. CIRC PKR FLUID, SET PKR. SION & MONITOR BS FOR PRESSURE BUILDUP. IF NO PRESSURE BUILDUP, NOTIFY EPA OF MIT NEXT DAY, SION, MIT TEST TO 1000# ON BS FOR 30 MINS, RELEASE WELL TO PROD.
3. IF CSG FAILS TEST, POH W/INJ EQPT, GIH W/RBP, DUMP 10' SD ON RBP @ 5400', POH, GIH W/TRTG PKR ON WS, ISOLATE LEAK. POH, DO SQUEEZE WORK UNDER PACKER IF ABOVE 4500', UNDER CMT RET BELOW 4500'.

DRILLING FOREMAN SQUEEZE CASING LEAK W/DESIGN BASED ON DEPTH, LENGTH OF LEAKING INTERVAL AND ESTABLISHED INJECTION RATE; AND NOTIFY EPA AND BLM TO WITNESS SQUEEZE. THE GIH, CIRC SND OF RBP & LATCH ON, POH W/RBP.

4. RERUN INJ EQPT AND MIT TEST AS IN STEP 2.

TOM COCHRANE 9-9-93

TOM COCHRANE 8-11-93

Sept 29, 1993

TO: Lisha Cordova - Utah Mining
Oil & Gas

FROM: Janice Easley
BLM Farmington, NM
505 599-6355

Here is copy of Rutherford Unit
Successor Operator,

4 pages including this one.

File Ratherford Unit (GC)

RECEIVED
BLM

JUL 27 11:44

Navajo Area Office
P. O. Box 1060
Gallup, New Mexico 87305-1060

070 FARMINGTON, NM

ARES/543

JUL 28 1993

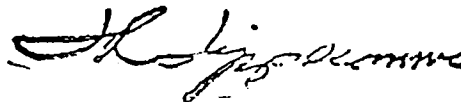
Mr. G. D. Cox
Mobil Exploration and
Producing North America, Inc.
P. O. Box 633
Midland, Texas 79702

Dear Mr. Cox:

Enclosed for your information and use is the approved Designation of Operator between the Phillips Petroleum Company and Mobil Exploration and Producing North America, Inc. for the Ratherford Unit.

Please note that all other concerned parties will be furnished their copy of the approved document.

Sincerely,



ACTING Area Director

Enclosure

cc: Bureau of Land Management, Farmington District Office w/enc.
TNN, Director, Minerals Department w/enc.

MINERAL RIGHTS
DATE 1/93
BY [Signature]
3
2
ALL SUPPLY
1/93

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF INDIAN AFFAIRS

RECEIVED
BLM

DESIGNATION OF OPERATOR

Phillips Petroleum Company is, on the records of the Bureau of Indian Affairs, operator of the Ratherford Unit,

AREA OFFICE: Window Rock, Arizona
LEASE NO: Attached hereto as Exhibit "A"

070 FARMINGTON, NM

and, pursuant to the terms of the Ratherford Unit Agreement, is resigning as Unit Operator effective July 1, 1993, and hereby designates

NAME: Mobil Exploration and Producing North America Inc., duly elected pursuant to the terms of the Ratherford Unit Agreement,

ADDRESS: P. O. Box 633, Midland, Texas 79702
Attn: G. D. Cox

as Operator and local agent, with full authority to act on behalf of the Ratherford Unit lessees in complying with the terms of all leases and regulations applicable thereto and on whom the authorized officer may serve written or oral instructions in securing compliance with the Operating Regulations (43 CFR 3160 and 25 CFR 211 and 212) with respect to (described acreage to which this designation is applicable):

Attached hereto as Exhibit "A"

Bond coverage under 25 CFR 211, 212 or 225 for lease activities conducted by the above named designated operator is under Bond Number 05202782 (attach copy). Evidence of bonding is required prior to the commencement of operations.

It is understood that this designation of operator does not relieve any lessee of responsibility for compliance with the terms of the leases and the Operating Regulations. It is also understood that this designation of operator does not constitute an assignment of any interest in the leases.

In case of default on the part of the designated operator, the lessees will make full and prompt compliance with all regulations, lease terms, stipulations, or orders of the Secretary of the Interior or his representative.

Attached is the appropriate documentation relevant to this document.

The designated operator agrees to promptly notify the authorized officer of any change in the operatorship of said Ratherford Unit.

Phillips Petroleum Company

June 17, 1993

By: M. B. [Signature]
Attorney-in-Fact

Mobil Exploration and Producing
North America Inc.

June 11, 1993

By: B. D. Martiny
Attorney-in-Fact B.D. MARTINY

[Signature] ACTING AREA DIRECTOR
APPROVED BY TITLE DATE
7/9/93

APPROVED PURSUANT, TO SECRETARIAL REDELEGATION ORDER 209 DM 8 AND 230 DM 3.

This form does not constitute an information collection as defined by 44 U.S.C. 3502 and therefore does not require OMB approval.

EXHIBIT "A"

ATTACHED TO AND MADE A PART OF DESIGNATION OF SUCCESSOR OPERATOR, RATHERFORD UNIT

EXHIBIT "C"

Revised as of September 29, 1992
SCHEDULE OF TRACT PERCENTAGE PARTICIPATION

<u>Tract Number</u>	<u>Description of Land</u>	<u>Serial Number and Effective Date of Lease</u>	<u>Tract Percentage Participation</u>
1	S/2 Sec. 1, E/2 SE/4 Sec. 2, E/4 Sec. 11, and all of Sec. 12, T-41-S, R-23-E, S.L.M. San Juan County, Utah	14-20-603-246-A Oct. 5, 1953	11.0652565
2	SE/4 and W/2 SW/4 Sec. 5, the irregular SW/4 Sec. 6, and all of Sec. 7 and 8, T-41-S, R-24-E, San Juan County, Utah	14-20-603-368 Oct. 26, 1953	14.4159942
3	SW/4 of Sec. 4, T-41-S, R-24-E, San Juan County, Utah	14-20-603-5446 Sept. 1, 1959	.5763826
4	SE/4 Sec. 4, and NE/4 Sec. 9, T-41-S, R-24-E, San Juan County, Utah	14-20-603-4035 March 3, 1958	1.2587779
5	SW/4 of Sec. 3, T-41-S, R-24-E, S.L.M., San Juan County, Utah	14-20-603-5445 Sept. 3, 1959	.4667669
6	NW/4 of Sec. 9, T-41-S, R-24-E, S.L.M., San Juan County, Utah	14-20-603-5045 Feb. 4, 1959	1.0187043
7	NW/4, W/2 NE/4, and SW/4 Sec. 10, SE/4 Sec. 9, T-41-S, R-24-E, San Juan County, Utah	14-20-603-4043 Feb. 18, 1958	3.5097575
8	SW/4 Sec. 9, T-41-S, R-24-E, S.L.M. San Juan County, Utah	14-20-603-5046 Feb. 4, 1959	1.1141679
9	SE/4 Sec. 10 and S/2 SW/4 Sec. 11 T-41-S, R-24-E, San Juan County, Utah	14-20-603-4037 Feb. 14, 1958	2.6186804
10	All of Sec. 13, E/2 Sec. 14, and E/2 SE/4 and N/2 Sec. 24, T-41-S, R-23-E, S.L.M., San Juan County, Utah	14-20-603-247-A Oct. 5, 1953	10.3108861
11	Sections 17, 18, 19 and 20, T-41-S, R-24-E, San Juan County Utah	14-20-603-353 Oct. 27, 1953	27.3389265
12	Sections 15, 16, 21, and NW/4, and W/2 SW/4 Sec. 22, T-41-S, R-24-E, San Juan County, Utah	14-20-603-355 Oct. 27, 1953	14.2819339
13	W/2 Section 14, T-41-S, R-24-E, San Juan County, Utah	14-20-603-370 Oct. 26, 1953	1.8500847
14	N/2 and SE/4, and E/2 SW/4 Sec. 29, NE/4 and E/2 SE/4 and E/2 W/2 irregular Sec. 30, and E/2 NE/4 Sec. 32, T-41-S, R-24-E, San Juan County, Utah	14-20-603-407 Dec. 10, 1953	6.9924969
15	NW/4 Sec. 28, T-41-S, R24-E San Juan County, Utah	14-20-603-409 Dec. 10, 1953	.9416393
16	SE/4 Sec. 3, T-41-S, R-24-E San Juan County, Utah	14-20-0603-6504 July 11, 1961	.5750254
17	NE/4 Sec. 3, T-41-S, R-24-E San Juan County, Utah	14-20-0603-6505 July 11, 1961	.5449292
18	NW/4 Sec. 3, T-41-S, R-24-E San Juan County, Utah	14-20-0603-6506 July 11, 1961	.5482788
19	NE/4 Sec. 4, T-41-S, R24-E San Juan County, Utah	14-20-0603-7171 June 11, 1962	.4720628
20	E/2 NW/4 Sec. 4, T-41-S, R-24-E San Juan County, Utah	14-20-0603-7172 June 11, 1962	.0992482

100% Indian Lands

TOTAL 12,909.74

100.0000000

Division of Oil, Gas and Mining
PHONE CONVERSATION DOCUMENTATION FORM

Route original/copy to:

☐ Well File _____

☐ Suspense
(Return Date) _____
(To - Initials) _____

☒ Other
OPERATOR CHANGE

(Location) Sec _____ Twp _____ Rng _____

(API No.) _____

1. Date of Phone Call: 10-6-93 : Time: 9:30

2. DOGM Employee (name) L. CORDOVA (Initiated Call ☒
Talked to:

Name GLEN COX (Initiated Call ☐ - Phone No. (915)688-2114

of (Company/Organization) MOBIL

3. Topic of Conversation: OPERATOR CHANGE FROM PHILLIPS TO MOBIL "RATHERFORD UNIT".

(NEED TO CONFIRM HOW OPERATOR WANTS THE WELLS SET UP - MEPNA AS PER BIA APPROVAL

OR MOBIL OIL CORPORATION AS PER SUNDRY DATED 9-8-93?)

4. Highlights of Conversation: _____

MR. COX CONFIRMED THAT THE WELLS SHOULD BE SET UNDER ACCOUNT N7370/MEPNA AS

PER BIA APPROVAL, ALSO CONFIRMED THAT PRODUCTION & DISPOSITION REPORTS WILL NOW

BE HANDLED OUT OF THEIR CORTEZ OFFICE RATHER THAN DALLAS.

MEPNA-

PO DRAWER G

CORTEZ, CO 81321

(303)565-2212

*ADDRESS CHANGE AFFECTS ALL WELLS CURRENTLY OPERATED BY MEPNA, CURRENTLY

REPORTED OUT OF DALLAS (MCELMO CREEK).

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING

OCT 25 1993

TRANSFER OF AUTHORITY TO INJECT - UIC FORM 5

Well name and number: _____	
Field or Unit name: <u>RATHERFORD UNIT</u>	API no. _____
Well location: QQ _____ section _____ township _____ range _____ county _____	
Effective Date of Transfer: <u>July 1, 1993</u>	
CURRENT OPERATOR	
Transfer approved by:	
Name <u>Ed Hasely</u>	Company <u>Phillips Petroleum Company</u>
Signature <u>Ed Hasely</u>	Address <u>5525 HWY. 64</u>
Title <u>Environmental Engineer</u>	<u>Farmington, NM 87401</u>
Date <u>October 22, 1993</u>	Phone (<u>505</u>) <u>599-3460</u>
Comments:	
NEW OPERATOR	
Transfer approved by:	
Name <u>Shirley Todd</u>	Company <u>Mobil Exploration & Producing North America</u>
Signature <u>Shirley Todd</u>	Address <u>P O Box 633</u>
Title <u>Env. & Reg. Technician</u>	<u>Midland, TX 79702</u>
Date <u>October 7, 1993</u>	Phone (<u>915</u>) <u>688-2585</u>
Comments:	
(State use only)	
Transfer approved by <u>[Signature]</u>	Title <u>SEC Manager</u>
Approval Date <u>10-27-93</u>	

Lisha Cordova (801) 538-5340

BEFORE THE OIL AND GAS CONSERVATION COMMISSION OF THE STATE OF UTAH

APPLICATION OF PHILLIPS PETROLEUM)
 COMPANY FOR THE APPROVAL OF THE)
 UNIT OPERATIONS AND PRESSURE MAIN-) CAUSE NO. 63
 TENANCE PROGRAM FOR THE RATHERFORD)
 UNIT IN THE GREATER ANETH AREA,)
 SAN JUAN COUNTY, UTAH)

ORDER

This Cause came on for hearing before the Oil and Gas Conservation Commission of the State of Utah at 10 o'clock a. m. on Wednesday, September 13, 1961, in the Crystal Room, Hotel Newhouse, Fourth South at Main Street, Salt Lake City, Utah, pursuant to notice duly and regularly given. The entire Commission, except Walter G. Mann, was present, Edward W. Clyde presiding. Appearances were made as follows: Cecil C. Hamilton, attorney, on behalf of Phillips Petroleum Company; Clair M. Senior, attorney, on behalf of Texaco, Inc.; Gordon Mayberry, attorney, on behalf of Continental Oil Company; R. R. Robison on behalf of Shell Oil Company. Others present included Carl Trawick, on behalf of United States Geological Survey; and J. R. White, on behalf of Texaco, Inc.

Evidence in support of the application was introduced by Phillips Petroleum Company, the applicant and Unit Operator of the Ratherford Unit, which embraces as the unit area the following described land in San Juan County, State of Utah, to wit:

TOWNSHIP 41 SOUTH, RANGE 23 EAST, SLPM

Section 1:	All	Sections 12 and 13:	All
Section 2:	S/2	Section 14:	S/2
Section 11:	S/2	Section 24:	All

TOWNSHIP 41 SOUTH, RANGE 24 EAST, SLPM

Section 3:	SW/4	Sections 15	
Section 4:	S/2	through 21:	All
Sections 5 through 9:	All	Section 22:	NE/4 and
Section 10:	S/2 and NE/4		W/2 of the
	and W/2 of NE/4		SW/4
Section 11:	S/2 of SW/4	Section 23:	NE/4 and
			W/2 of NE/4
Section 14:	W/2		and W/2 of SW/4
		Section 29 and 30:	All
		Section 31:	N/2
		Section 32:	S/2

R. R. Robison on behalf of Shell Oil Company stated that (as contemplated by paragraph No. 5 of the Commission's order of February 24, 1959, in Cause No. 17 authorizing the drilling of certain test wells) Shell would submit to the Commission, as arbiter, the question as between Shell and Superior Oil Company

of the monetary value, if any, to be attributed to three test wells drilled within the Ratherford Unit area pursuant to said order of February 24, 1959.

No objection to the granting of the application was filed or expressed. The Shell Oil Company, Texaco, Inc. and Continental Oil Company expressed their support of the application of Phillips Petroleum Company.

FINDINGS OF FACT

The Commission finds that:

1. The unitized operation of the Ratherford Unit Area will enable pressure maintenance operations to be initiated and permit such Area to be operated in a manner which will prevent waste, protect correlative rights and result in greater ultimate recovery of oil and gas.

2. The Ratherford Unit Agreement has been approved by the various signatory parties as fair, reasonable and acceptable.

3. The water injection pressure maintenance program proposed by the applicant appears to be proper and designed to result in the greatest economic recovery of oil and gas to the end that all concerned, including the general public, may realize and enjoy the greatest good from the oil and gas resources of the unitized lands.

ORDER

THEREFORE, IT IS ORDERED BY THE COMMISSION, and subject to its continuing jurisdiction, that:

1. Unit operation of the Ratherford Unit Area under the Ratherford Unit Agreement is approved.


2. The plan and program of water injection pressure maintenance operations proposed by applicant in its application filed herein should be and the same is hereby approved and the unit operator is authorized to proceed with and under such plan and program as soon as the Ratherford Unit Agreement becomes effective and operative.

3. If, at any time or from time to time, it appears necessary or desirable to the unit operator to alter or modify the hereby approved plan of pressure maintenance, any such alteration or modification shall be submitted for

and shall be subject to approval by the Commission or its delegated representative, which approval may be given without notice or hearing, unless otherwise ordered or directed by the Commission.

Dated this 13th day of September, 1961.


THE OIL AND GAS CONSERVATION
COMMISSION OF THE STATE OF UTAH


Edward W. Clyde, Commissioner, presiding


C. R. Henderson, Chairman


M. V. Hatch, Commissioner


C. S. Thomson, Commissioner


Walter G. Mann, Commissioner

Division of Oil, Gas and Mining
OPERATOR CHANGE WORKSHEET

Routing:	
1	REC/47-33
2	DP/58-114
3	VLC
4	RJH
5	DP/22
6	RL

Attach all documentation received by the division regarding this change.
 Initial each listed item when completed. Write N/A if item is not applicable.

- ☒ Change of Operator (well sold) ☐ Designation of Agent
☐ Designation of Operator ☐ Operator Name Change Only

The operator of the well(s) listed below has changed (EFFECTIVE DATE: 7-1-93)

TO (new operator) M E P N A
 (address) PO DRAWER G
CORTEZ, CO 81321
GLEN COX (915)688-2114
 phone (303) 565-2212
 account no. N7370

FROM (former operator) PHILLIPS PETROLEUM COMPANY
 (address) 5525 HWY 64 NBU 3004
FARMINGTON, NM 87401
PAT KONKEL
 phone (505) 599-3452
 account no. N0772(A)

Well(s) (attach additional page if needed):

***RATHERFORD UNIT (NAVAJO)**

Name: **SEE ATTACHED**	API: <u>43037-16416</u>	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____

OPERATOR CHANGE DOCUMENTATION

- See 1. (Rule R615-8-10) Sundry or other legal documentation has been received from former operator (Attach to this form). (Reg. 8-20-93) (6/93 Prod. Rpt. 8-16-93)
- See 2. (Rule R615-8-10) Sundry or other legal documentation has been received from new operator (Attach to this form). (Reg. 8-31-93) (Rec'd 9-14-93)
- N/A 3. The Department of Commerce has been contacted if the new operator above is not currently operating any wells in Utah. Is company registered with the state? (yes/no) _____ If yes, show company file number: _____
- See 4. (For Indian and Federal Wells ONLY) The BLM has been contacted regarding this change (attach Telephone Documentation Form to this report). Make note of BLM status in comments section of this form. Management review of Federal and Indian well operator changes should take place prior to completion of steps 5 through 9 below.
- See 5. Changes have been entered in the Oil and Gas Information System (Wang/IBM) for each well listed above. (026 wells 10-6-93) (Wiw's 10-26-93)
- See 6. Cardex file has been updated for each well listed above. (026 wells 10-6-93) (Wiw's 10-26-93)
- See 7. Well file labels have been updated for each well listed above. (026 wells 10-6-93) (Wiw's 10-26-93)
- See 8. Changes have been included on the monthly "Operator, Address, and Account Changes" memo for distribution to State Lands and the Tax Commission. (10-6-93)
- See 9. A folder has been set up for the Operator Change file, and a copy of this page has been placed there for reference during routing and processing of the original documents.

ENTITY REVIEW

- Yes 1. (Rule R615-8-7) Entity assignments have been reviewed for all wells listed above. Were entity changes made? (yes/no) no (If entity assignments were changed, attach copies of Form 6, Entity Action Form).
- N/A 2. State Lands and the Tax Commission have been notified through normal procedures of entity changes.

BOND VERIFICATION (Fee wells only)

- Yes 1. (Rule R615-3-1) The new operator of any fee lease well listed above has furnished a proper bond.
- N/A 2. A copy of this form has been placed in the new and former operators' bond files.
3. The former operator has requested a release of liability from their bond (yes/no) . Today's date 19 . If yes, division response was made by letter dated 19 .

LEASE INTEREST OWNER NOTIFICATION RESPONSIBILITY

- N/A 1. (Rule R615-2-10) The former operator/lessee of any fee lease well listed above has been notified by letter dated 19 , of their responsibility to notify any person with an interest in such lease of the change of operator. Documentation of such notification has been requested.
- N/A 2. Copies of documents have been sent to State Lands for changes involving State leases.

FILMING

1. All attachments to this form have been microfilmed. Date: 11-17 1993.

FILING

- Yes 1. Copies of all attachments to this form have been filed in each well file.
2. The original of this form and the original attachments have been filed in the Operator Change file.

COMMENTS

931006 BIA/BLM Approved 7-9-93.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.

Use "APPLICATION FOR PERMIT - " for such proposals

SUBMIT IN TRIPLICATE

1. Type of Well

☐ Oil Well ☐ Gas Well ☒ Other

2. Name of Operator

MOBIL EXPLORATION & PRODUCING US, AS AGENT FOR MEPNA

3. Address and Telephone No.

P. O. BOX 633, MIDLAND, TX 79702

(915) 688-2585

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

510' FNL, 1830' FWL; SEC.17, T41S, R24E

FORM APPROVED

Budget Bureau No. 1004-0135

Expires: March 31, 1993

5. Lease Designation and Serial No.

14-20-603-353

6. If Indian, Allottee or Tribe Name

NAVAJO TRIBAL

7. If Unit or CA, Agreement Designation

RATHERFORD UNIT

8. Well Name and No.

RATHERFORD UNIT 17W-21

9. API Well No.

43-037-16416

10. Field and Pool, or exploratory Area

GREATER ANETH

11. County or Parish, State

SAN JUAN,

UT

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION

☐ Notice of Intent
☒ Subsequent Report
☐ Final Abandonment Notice

TYPE OF ACTION

☐ Abandonment
☐ Recompletion
☐ Plugging Back
☐ Casing Repair
☐ Altering Casing
☐ Other WORKOVER
☐ Change of Plans
☐ New Construction
☐ Non-Routine Fracturing
☐ Water Shut-Off
☐ Conversion to Injection
☐ Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

09/14/93 MIRU.

09/15/93 BLOW WELL DOWN. ND WH, NU BOP. REL PKR & POOH W/TBG & PKR.

09/16/93 REPLACE ALL SEAL RINGS TO HP. INSTALL WRAP-AROUND IN WELLHEAD. CIRC PKR FLUID & SET PKR @ 5414'. PRESS TEST CSG TO 1030 PSI F/30 MIN - HELD OK. RETURN WELL TO INJECTION. RDMO.

14. I hereby certify that the foregoing is true and correct

Signed

D. J. Shively

Title

ENV & REG TECHNICIAN

Date

5-20-94

(This space for Federal or State office use)

Approved by

Title

Conditions of approval, if any:

Tax Credit

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

RECEIVED
- 7 1995

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different formation, GAS & MINERAL
Use "APPLICATION FOR PERMIT -" for such proposals

5. Lease Designation and Serial No.

14-20-603-353

6. If Indian, Allottee or Tribe Name

NAVAJO TRIBAL

7. If Unit or CA, Agreement Designation
RATHERFORD UNIT

8. Well Name and No.

RATHERFORD 17-21

9. API Well No.

43-037-16416

10. Field and Pool, or exploratory Area
GREATER ANETH

11. County or Parish, State

SAN JUAN UT

SUBMIT IN TRIPLICATE

1. Type of Well

☐ Oil Well ☐ Gas Well ☒ Other Injection

2. Name of Operator Mobil Exploration & Producing U.S. Inc.
as Agent for Mobil Producing TX & NM Inc.

3. Address and Telephone No.

P.O. Box 633, Midland, TX 79702 915/688-2585

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

510' FNL; 1830' FWL
SEC. 17, T41S, R24E

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION

- ☐ Notice of Intent
☒ Subsequent Report
☐ Final Abandonment Notice

TYPE OF ACTION

- ☐ Abandonment
☐ Recompletion
☐ Plugging Back
☐ Casing Repair
☐ Altering Casing
☒ Other WORKOVER
☐ Change of Plans
☐ New Construction
☐ Non-Routine Fracturing
☐ Water Shut-Off
☐ Conversion to Injection
☐ Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

08-25-93 MIRU. FILL TBG W/ 11 BBLS FW & PRES TEST TO 2000 PSI. HELD OK. RIH TO PKR @ 5478'
BEGIN WASHING TO 5566 W/ 4050 PSI TBG PRES @ 1/2 BPM RATE CIR WELL CLEAN THEN
ACIDIZED W/4000 GALS ACROSS PERF INTERVALS F/5512-5566'. ISIP 3600 PSI FLOWBACK WEL
SI HOOK UP WELLHEAD & INJ LINE-RETURN WELL TO INJ.
09-14-93 RU OPEN WELL 2300 PIS TBG PRESS FLOW TO TEST TANK F/8.5 HRS RECOVERING 720 BBLS
WTR. SI W/ ENDING TBG PRES OF 35 PSI
09-15-93 OPEN WELL 2200 PSI TBG PRESS BLOW WELL DOWN ND WELLHEAD NU BOP. REL BAKER 5.5"
LOK-SET PKR POOH TBG LD PKR PU
09-16-93 CIR PKR FLUID. SET PKR @ 5414' NU WELLHEAD. PRES TEST CSG TO 1030 PSI F/30 MIN-HELD
OK. NU INJ LINES & RETURN WELL BACK TO INJ
10-29-93 MIRU BLOW OFF HEAD TO PIT ND WELLHEAD REL BAKER LOK-SET PKR & LD 1 JT TBG RE-SET
PKR @ 5383' PRES TEST CSG TO 1100 PSI-HELD OK F/30 MIN RDMO

14. I hereby certify that the foregoing is true and correct

Signed Shalee Robinson

Title ENV & REG TECHNICIAN

Date 4-4-95

(This space for Federal or State office use)

Approved by

Title

Date

Conditions of approval, if any:

PHONE CONVERSATION DOCUMENTATION FORM

Route original/copy to:

☐ **Well File** _____

☐ **Suspense**
(Return Date) _____
(To - Initials) _____

☒ **Other**
OPER NM CHG _____

(Location) Sec _____ Twp _____ Rng _____
(API No.) _____

1. Date of Phone Call: 8-3-95 Time: _____

2. DOGM Employee (name) L. CORDOVA (Initiated Call ☐)
Talked to:

Name R. J. FIRTH (Initiated Call ☒) - Phone No. () _____
of (Company/Organization) _____

3. Topic of Conversation: M E P N A / N7370

4. Highlights of Conversation: _____

OPERATOR NAME IS BEING CHANGED FROM M E P N A (MOBIL EXPLORATION AND PRODUCING
NORTH AMERICA INC) TO MOBIL EXPLOR & PROD. THE NAME CHANGE IS BEING DONE AT
THIS TIME TO ALLEVIATE CONFUSION, BOTH IN HOUSE AND AMONGST THE GENERAL PUBLIC.
*SUPERIOR OIL COMPANY MERGED INTO M E P N A 4-24-86 (SEE ATTACHED).

Mobil Oil Corporation

P.O. BOX 5444
DENVER, COLORADO 80217-5444

May 14, 1986

Utah Board of Oil, Gas and Mining
355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

RECEIVED
MAY 16 1986

Attn: R. J. Firth
Associate Director

DIVISION OF
OIL, GAS & MINING

SUPERIOR OIL COMPANY MERGER

Dear Mr. Firth:

On September 20, 1984, The Superior Oil Company (Superior) became a wholly owned subsidiary of Mobil Corporation. Since January 1, 1985, Mobil Oil Corporation (MOC), another wholly owned subsidiary of Mobil Corporation, has acted as agent for Superior and has operated the Superior-owned properties.

On April 24, 1986, Superior was merged with Mobil Exploration and Producing North America Inc. (MEPNA), which is also a wholly owned subsidiary of Mobil Corporation. MEPNA is the surviving company of the merger.

This letter is to advise you that all properties held in the name of Superior will now be held in the name of MEPNA; and that these properties will continue to be operated by MOC as agent for MEPNA.

Attached is a listing of all wells and a separate listing of injection-disposal wells, Designation of Agent and an organization chart illustrating the relationships of the various companies. If you have any questions or require additional documentation of this merger, please feel free to contact me at the above address or (303) 298-2577.

Very truly yours,



CNE/rd
CNE8661

R. D. Baker
Environmental Regulatory Manager

STATE OF UTAH
INVENTORY OF INJECTION WELLS

OPERATOR	API NO.	WELL	TNS	RGE	SE	WELLTYPE	INDIAN COUNT
*****	*****	*****	***	***	**	*****	*****
✓MEPNA (MOBIL	43-037-15722	16W23	41S	24E	16	INJW	Y
✓MEPNA (MOBIL	43-037-16414	16W21	41S	24E	16	INJW	Y
✓MEPNA (MOBIL	43-037-16416	17W21	41S	24E	17	INJW	Y
✓MEPNA (MOBIL	43-037-15726	17W12	41S	24E	17	INJW	Y
✓MEPNA (MOBIL	43-037-15731	17W41	41S	24E	17	INJW	Y
✓MEPNA (MOBIL	43-037-16417	17W43	41S	24E	17	INJW	Y
✓MEPNA (MOBIL	43-037-15728	17W23	41S	24E	17	INJW	Y
✓MEPNA (MOBIL	43-037-15730	17W34	41S	24E	17	INJW	Y
✓MEPNA (MOBIL	43-037-15729	17W32	41S	24E	17	INJW	Y
✓MEPNA (MOBIL	43-037-15727	17W14	41S	24E	17	INJW	Y
✓MEPNA (MOBIL	43-037-31153	18W12	41S	24E	18	INJW	Y
✓MEPNA (MOBIL	43-037-15737	18W34	41S	24E	18	INJW	Y
✓MEPNA (MOBIL	43-037-15736	18W32	41S	24E	18	INJW	Y
✓MEPNA (MOBIL	43-037-30244	18W23	41S	24E	18	INJW	Y
✓MEPNA (MOBIL	43-037-15735	18W14	41S	24E	18	INJW	Y
✓MEPNA (MOBIL	43-037-16418	18W21	41S	24E	18	INJW	Y
✓MEPNA (MOBIL	43-037-15738	18W41	41S	24E	18	INJW	Y
✓MEPNA (MOBIL	43-037-15741	19W21	41S	24E	19	INJW	Y
✓MEPNA (MOBIL	43-037-15742	19W23	41S	24E	19	INJW	Y
✓MEPNA (MOBIL	43-037-15745	19W41	41S	24E	19	INJW	Y
✓MEPNA (MOBIL	43-037-16420	19W43	41S	24E	19	INJW	Y
✓MEPNA (MOBIL	43-037-15748	20W23	41S	24E	20	INJW	Y
✓MEPNA (MOBIL	43-037-15751	20W41	41S	24E	20	INJW	Y
✓MEPNA (MOBIL	43-037-16423	20W21	41S	24E	20	INJW	Y
✓MEPNA (MOBIL	43-037-16424	20W43	41S	24E	20	INJW	Y
✓MEPNA (MOBIL	43-037-16427	21W43	41S	24E	21	INJW	Y
✓MEPNA (MOBIL	43-037-16425	21W21	41S	24E	21	INJW	Y
✓MEPNA (MOBIL	43-037-16431	28W21	41S	24E	28	INJI	Y
✓MEPNA (MOBIL	43-037-16433	29W41	41S	24E	29	INJW	Y
✓MEPNA (MOBIL	43-037-16432	29W21	41S	24E	29	INJW	Y
✓MEPNA (MOBIL	43-037-15338	29W23	41S	24E	29	INJI	Y
✓MEPNA (MOBIL	43-037-16434	29W43	41S	24E	29	INJW	Y
✓MEPNA (MOBIL	43-037-15343	30-41	41S	24E	30	INJW	Y
✓MEPNA (MOBIL	43-037-16435	30W21	41S	24E	30	INJI	--

Division of Oil, Gas and Mining
OPERATOR CHANGE WORKSHEET

Attach all documentation received by the division regarding this change.
 Initial each listed item when completed. Write N/A if item is not applicable.

☐ Change of Operator (well sold) ☐ Designation of Agent
☐ Designation of Operator ☒ Operator Name Change Only

Routing	
1-LEC	7-PL
2-LWP	8-SJ
3-DE	9-FILE
4-VLC	
5-RJF	
6-LWP	

The operator of the well(s) listed below has changed (EFFECTIVE DATE: 8-2-95)

TO (new operator) MOBIL EXPLOR & PROD
 (address) C/O MOBIL OIL CORP
PO DRAWER G
CORTEZ CO 81321
 phone (303) 564-5212
 account no. N7370

FROM (former operator) M E P N A
 (address) C/O MOBIL OIL CORP
PO DRAWER G
CORTEZ CO 81321
 phone (303) 564-5212
 account no. N7370

Well(s) (attach additional page if needed):

Name: <u>** SEE ATTACHED **</u>	API: <u>037-16416</u>	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____
Name: _____	API: _____	Entity: _____	Sec _____	Twp _____	Rng _____	Lease Type: _____

OPERATOR CHANGE DOCUMENTATION

- N/A 1. (Rule R615-8-10) Sundry or other legal documentation has been received from former operator (Attach to this form).
- N/A 2. (Rule R615-8-10) Sundry or other legal documentation has been received from new operator (Attach to this form).
- N/A 3. The Department of Commerce has been contacted if the new operator above is not currently operating any wells in Utah. Is company registered with the state? (yes/no) ____ If yes, show company file number: _____.
- N/A 4. (For Indian and Federal Wells ONLY) The BLM has been contacted regarding this change (attach Telephone Documentation Form to this report). Make note of BLM status in comments section of this form. Management review of **Federal and Indian** well operator changes should take place prior to completion of steps 5 through 9 below.
- Yes 5. Changes have been entered in the Oil and Gas Information System (Wang/IBM) for each well listed above. (8-3-95)
- LWP 6. Cardex file has been updated for each well listed above. 8-21-95
- Yes 7. Well file labels have been updated for each well listed above. 9-28-95
- Yes 8. Changes have been included on the monthly "Operator, Address, and Account Changes" memo for distribution to State Lands and the Tax Commission. (8-3-95)
- Yes 9. A folder has been set up for the Operator Change file, and a copy of this page has been placed there for reference during routing and processing of the original documents.

ENTITY REVIEW

- Lee* 1. (Rule R615-8-7) Entity assignments have been reviewed for all wells listed above. Were entity changes made? (yes/no) no (If entity assignments were changed, attach copies of Form 6, Entity Action Form).
- N/A* 2. State Lands and the Tax Commission have been notified through normal procedures of entity changes.

BOND VERIFICATION (Fee wells only) ** No Fee Lease Wells at this time!*

- N/A* *Lee* 1. (Rule R615-3-1) The new operator of any fee lease well listed above has furnished a proper bond.
- ___ 2. A copy of this form has been placed in the new and former operators' bond files.
- ___ 3. The former operator has requested a release of liability from their bond (yes/no) ___. Today's date _____ 19___. If yes, division response was made by letter dated _____ 19__.

LEASE INTEREST OWNER NOTIFICATION RESPONSIBILITY

- N/A* *UTS* *8/5/95* 1. (Rule R615-2-10) The former operator/lessee of any **fee lease** well listed above has been notified by letter dated _____ 19__, of their responsibility to notify any person with an interest in such lease of the change of operator. Documentation of such notification has been requested.
- N/A* 2. Copies of documents have been sent to State Lands for changes involving **State leases**.

FILMING

- ✓* 1. All attachments to this form have been microfilmed. Date: October 4 1995.

FILING

- ___ 1. Copies of all attachments to this form have been filed in each well file.
- ___ 2. The original of this form and the original attachments have been filed in the Operator Change file.

COMMENTS

950803 LIC F5/Not necessary!

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT -" for such proposals

SUBMIT IN TRIPLICATE

1. Type of Well <input type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input checked="" type="checkbox"/> Other	5. Lease Designation and Serial No. 14-20-603-353
2. Name of Operator MOBIL PRODUCING TX & NM INC.* *MOBIL EXPLORATION & PRODUCING US INC. AS AGENT FOR MPTM	6. If Indian, Allottee or Tribe Name NAVAJO TRIBAL
3. Address and Telephone No. P.O. Box 633, Midland TX 79702 (915) 688-2585	7. If Unit or CA, Agreement Designation RATHERFORD UNIT
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) SEC. 17, T41S, R24E 510 FNL & 1830 FWL	8. Well Name and No. RATHERFORD 17-W-21
	9. API Well No. 43-037-16416
	10. Field and Pool, or exploratory Area GREATER ANETH
	11. County or Parish, State SAN JUAN UT

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Abandonment
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Recompletion
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Plugging Back
	<input type="checkbox"/> Casing Repair
	<input type="checkbox"/> Altering Casing
	<input checked="" type="checkbox"/> Other SIDETRACK/INJECTOR
	<input type="checkbox"/> Change of Plans
	<input type="checkbox"/> New Construction
	<input type="checkbox"/> Non-Routine Fracturing
	<input type="checkbox"/> Water Shut-Off
	<input type="checkbox"/> Conversion to Injection
	<input type="checkbox"/> Dispose Water

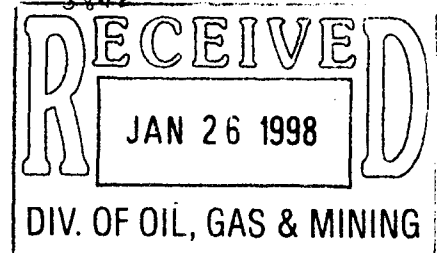
(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

BHL:

LATERAL #1 / 1115' NORTH & 1004' WEST F/SURFACE SPOT (ZONE 1c/1d) **3410N** **306W** **2774 FNL** **2060 FNL**
LATERAL #2 / 1189' SOUTH & 1071' EAST F/SURFACE SPOT (ZONE 1b) **3635** **377E**
LATERAL #3 / 923' NORTH & 1182' WEST F/SURFACE SPOT (ZONE 1a) **281N** **360W** **177 FSL** **899 FNL** **SEC 8**
LATERAL #4 / 985' SOUTH & 1261' EAST F/SURFACE SPOT (ZONE 1a) **3005** **304E**

SEE ATTACHED



14. I hereby certify that the foregoing is true and correct	
Signed <u><i>Shirley Houchins</i></u>	Title SHIRLEY HOUCHINS/ENV & REG TECH Date 1-19-98
(This space for Federal or State office use)	
Approved by <u><i>John R. Banya</i></u>	Title Associate Director Date 1/29/98
Conditions of approval, if any:	Utah DOLM

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

Ratherford Unit Well #17-21 Horizontal Drilling Procedure

The objective of this procedure is to prepare this wellbore for sidetracking, sidetrack the subject well and drill multilateral short radius horizontal laterals (1500-1600 feet).

1. Prepare location and dig working pit.
2. MIRU WSU, reverse unit, and H2S equipment. Bullhead kill weight fluid down tubing.
3. ND wellhead and NU BOP's. Pressure test BOP's to working pressure.
4. Continue to POH with related equipment (tubing and rods for producers or tubing and packer for injectors).
5. RU wireline to run any logs desired and run gage ring for casing size and weight.
6. Set retrievable bridge plug on wireline and pressure test casing to 1000 psi.
7. RDMO WSU.
8. MIRU 24 hr. WSU. NU BOP's and pressure test with chart.
9. PU tubing, drilling collars, and drill pipe in derrick and run in hole. Then POH and stand back.
10. Run packer on wireline and set using GR/CCL log to correlate with. RD wireline.
11. PU drillpipe with UBHO sub in string and latch into packer to survey the hole and obtain orientation of keyway. POH w/gyro and drill string.
12. Orient whipstock on surface to desired bearing and RIH on drill pipe. Latch into packer. Shear stater mill bolt and make starter cut.
13. POH w/ starter mill and pick up window mill and watermelon mill and continue to mill window. Drill 1-2 ft of formation
14. POH w/ mills and PU curve building assembly and drill string with UBHO sub in string and RIH.
15. RU gyro to assist in time drilling and starting out of the casing window. POH w/ gyro when inclination dictates it must be pulled.
16. Finish drilling the curve using the MWD.
17. POH once curve is finished and PU lateral motor to drill the lateral using MWD.
18. Once lateral TD is reached, POH w/ directional equipment.
19. PU retrieving hook and RIH on drill pipe. Retrieve whipstock and PU new whipstock oriented for desired bearing to start in hole.
20. Repeat steps 12 through 19 for each subsequent lateral.

RATHERFORD UNIT # 17W-21

GREATER ANETH FIELD

510' FNL & 1830' FWL

SEC 17-T41S-R24E

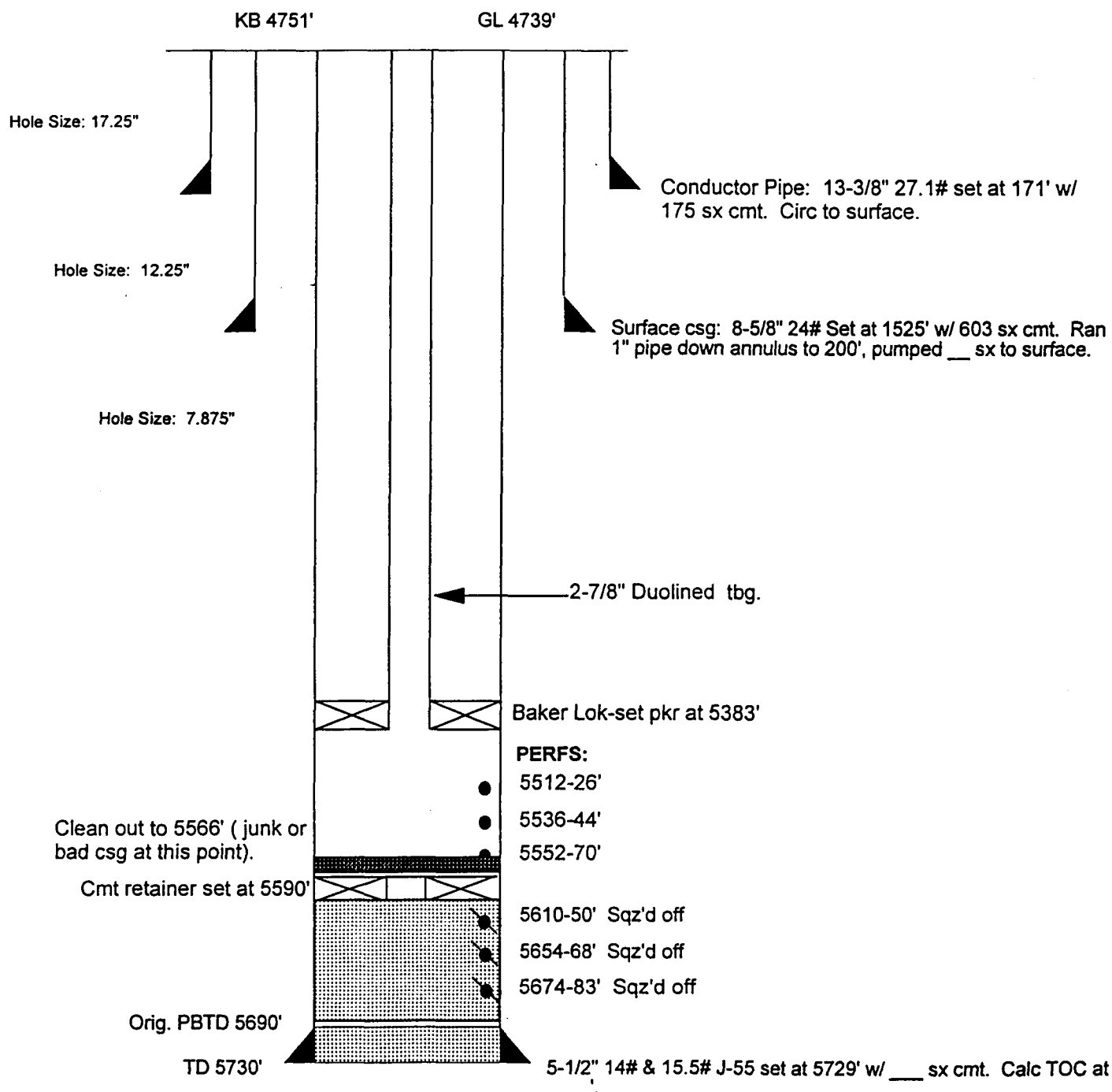
SAN JUAN COUNTY, UTAH

API 43-037-16416

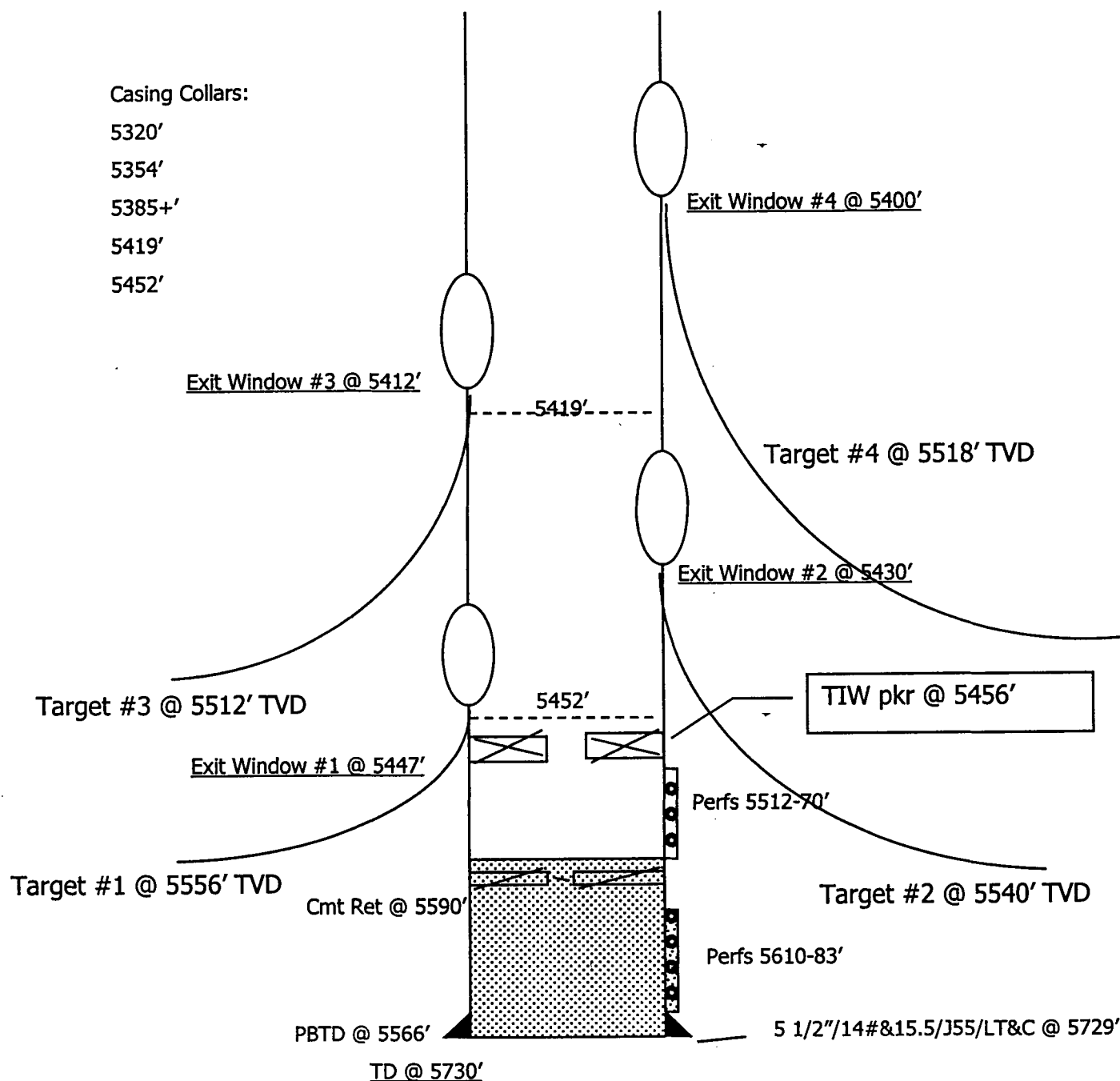
PRISM 0043049

INJECTOR

Capacities:	bb/ft	gal/ft	cuft/ft
2-7/8" 6.5#	.00579	.2431	.0325
5-1/2" 14#	.0244	1.0249	.1370
5-1/2" 15.5#	.0238	.9997	.1336
2-7/8x5.5"14#	.0164	.6877	
.0919			
2-7/8x5.5"15.5#	.0158	.6625	
.0886			



Ratherford Unit #17-21



Window	Btm-Top of Window	Ext length	Curve Radius	Bearing	Horiz Displ
1	5447-41	-----	109	318	1500
2	5430-24	17	110	138	1600
3	5412-06	33	100	308	1500
4	5400-5396	45	118	128	1600

The double spline is 2.42 ft long and the bottom of the whipstock, the latch, the debris and the shear sub are 8.68 ft long. These lengths must be added to the extension lengths to determine the entire whipstock assembly length.

WORKSHEET
APPLICATION FOR PERMIT TO DRILL

APD RECEIVED: 01/26/98

API NO. ASSIGNED: 43-037-16416

WELL NAME: RATHERFORD 17-W-21
OPERATOR: MOBIL EXPL & PROD (N7370)

PROPOSED LOCATION:

NENW 17 - T41S - R24E
SURFACE: 0510-FNL-1830-FWL
BOTTOM: ~~0177-FSL-0899-FWL~~ *Multi-lateral*
SAN JUAN COUNTY
GREATER ANETH FIELD (365)

LEASE TYPE: IND
LEASE NUMBER: 14-20-603-353

PROPOSED PRODUCING FORMATION: DSCR

INSPECT LOCATION BY: / /

TECH REVIEW	Initials	Date
Engineering		
Geology		
Surface		

RECEIVED AND/OR REVIEWED:

☒ Plat
☒ Bond: Federal [☒ State [] Fee []
(Number ALREADY IN PLACE)
☒ Potash (Y/N)
☒ Oil shale (Y/N)
☒ Water permit
(Number CITY OF PRICE)
☒ RDCC Review (Y/N)
(Date: _____)

LOCATION AND SITING:

☒ R649-2-3. Unit: RATHERFORD UNIT
____ R649-3-2. General.
____ R649-3-3. Exception.
____ Drilling Unit.
____ Board Cause no: _____
____ Date: _____

COMMENTS:

STIPULATIONS:

1. Directional drilling.



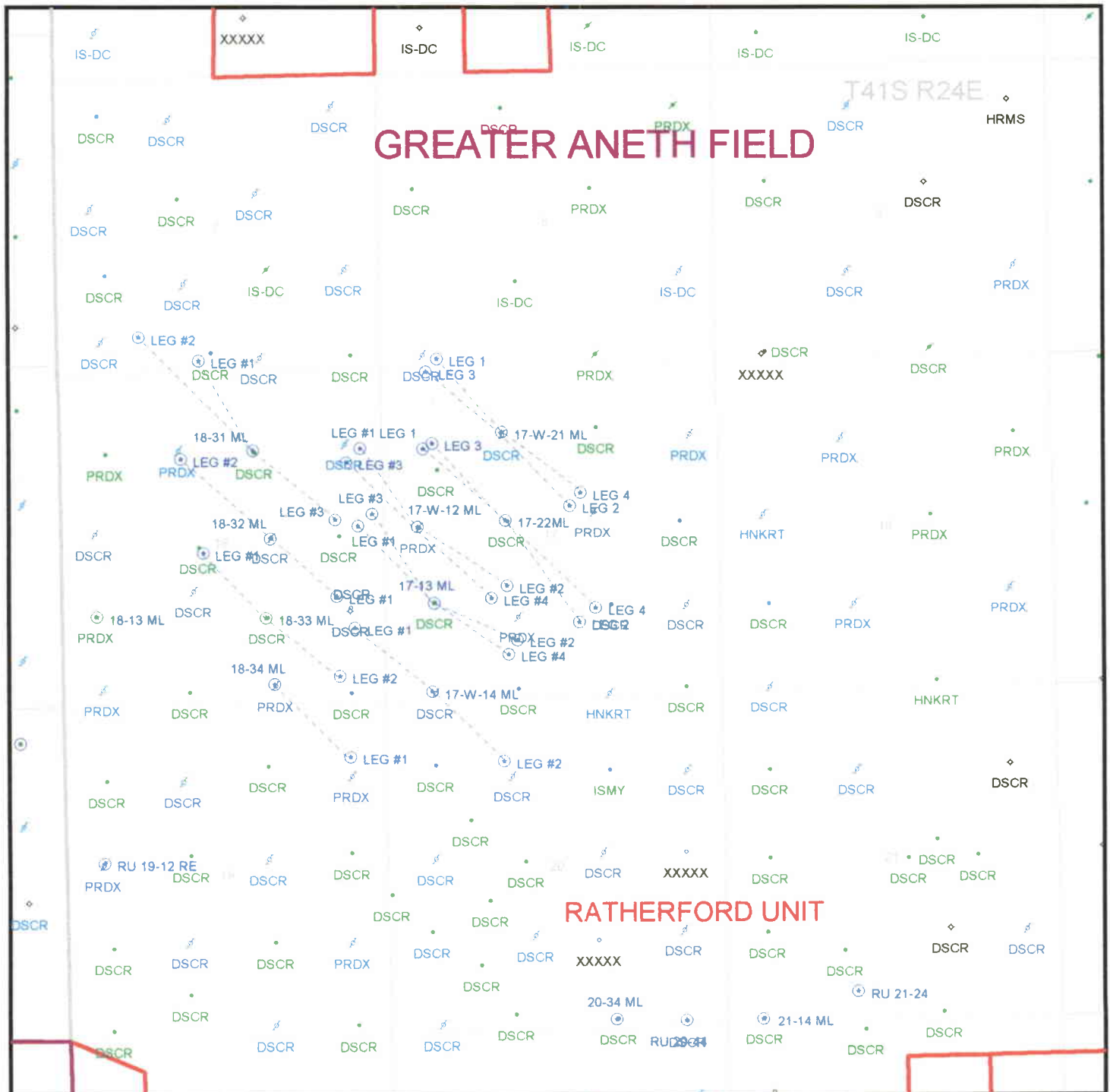
DIVISION OF OIL, GAS & MINING

OPERATOR: MOBIL EXPL & PROD (N7370)

FIELD: GREATER ANETH (365)

SEC. TWP. RNG.: SEC. 17, T41S, R24E

COUNTY: SAN JUAN UAC: R649-2-3 RETHERFORD UNIT



DATE PREPARED:
28-JAN-1998



State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Michael O. Leavitt
Governor

Ted Stewart
Executive Director

Lowell P. Braxton
Division Director

1594 West North Temple, Suite 1210

PO Box 145801

Salt Lake City, Utah 84114-5801

801-538-5340

801-359-3940 (Fax)

801-538-7223 (TDD)

January 29, 1998

Mobil Exploration & Producing
P.O. Box 633
Midland Tx 79702

Re: Ratherford Unit 17-W-21(Re-Entry), 510' FNL, 1830' FWL,
NE NW, SEC. 17, T.41 S., R.21 E., San Juan County, Utah

Gentlemen:

Pursuant to the provisions and requirements of Utah Code Ann. 40-6-1 et seq., Utah Administrative Code R649-3-1 et seq., and the attached Conditions of Approval, approval to re-enter and drill the referenced well is granted.

This approval shall expire one year from the above date unless substantial and continuous operation is underway, or a request for extension is made prior to the expiration date. The API identification number assigned to this well is 43-037-16416.

Sincerely,

A handwritten signature in black ink, appearing to read 'John R. Baza'.

John R. Baza
Associate Director

ls

Enclosures

cc: San Juan County Assessor
Bureau of Land Management, Moab District Office

Operator: Mobil Exploration & Producing
Well Name & Number: Ratherford Unit 17-W-21(Re-Entry)
API Number: 43-037-16416
Lease: 14-20-603-353
Location: NE NW Sec. 17 T. 41 S. R. 24 E.

Conditions of Approval

1. General

Compliance with the requirements of Utah Admin. R. 649-1 et seq., the Oil and Gas Conservation General Rules, and the applicable terms and provisions of the approved Application for Permit to Drill.

2. Notification Requirements

Notify the Division within 24 hours following spudding the well or commencing drilling operations. Contact Jim Thompson at (801)538-5336.

Notify the Division prior to commencing operations to plug and abandon the well. Contact John R. Baza (801)538-5334.

3. Reporting Requirements

All required reports, forms and submittals shall be promptly filed with the Division, including but not limited to the Entity Action Form (Form 6), Report of Water Encountered During Drilling (Form 7), Weekly Progress Reports for drilling and completion operations, and Sundry Notices and Reports on Wells requesting approval of change of plans or other operational actions.

4. In accordance with Utah Admin. R. 649-3-11, Directional Drilling, submittal of a complete angular deviation and directional survey report is required.

DIVISION OF OIL, GAS AND MINING

SPUDDING INFORMATION

Name of Company: MOBIL E & P

Well Name: RATHERFORD UNIT 17-W-21

Api No. 43-037-16416

Section 17 Township 41S Range 24E County SAN JUAN

Drilling Contractor BIG "A"

Rig # 25

SPUDDED:

Date 4/10/98

Time

How ROTARY

Drilling will commence

Reported by SIMON

Telephone #

Date: 4/13/98 Signed: JLT

✓



ROCKY MOUNTAIN GEO-ENGINEERING

Electronic Rig Monitoring Systems • Well Logging • Consulting Geology • Coal Bed Methane Services

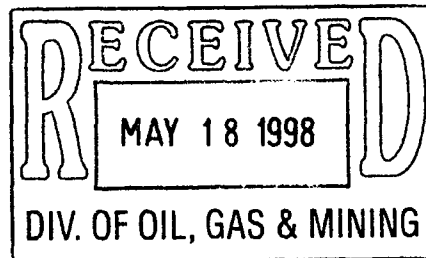
PASON ROCKY MOUNTAIN GEO-ENGINEERING CORP.

2450 INDUSTRIAL BLVD. • GRAND JUNCTION, CO 81505

(970) 243-3044 • (FAX) 241-1085

Tuesday, May 12, 1998

Division of Oil & Gas Mining
State of Utah
1594 West North Temple
3 Triad Center, Ste. 1210
Salt Lake City, UT 84116



Re: Ratherford Unit #17-21 Legs 1, 2, 3, 4
Sec. 17, T41S, R24E **43 037 16416**
San Juan County, Utah **DRL**

Dear Sirs:

Enclosed is the final computer colored log and geology report for the above referenced well.
IN LOG FILE

We appreciate the opportunity to be of service to you and look forward to working with you again in the near future.

If you have any questions regarding the enclosed data, please contact us.

Sincerely,

Bill Nagel
Senior Geologist

BN/dn

Enc. 1 Final Computer Colored Log and Geology Report For Each Leg

cc Letter Only; Dana Larson; Mobil E & P U.S., Inc.; Midland, TX

MOBIL

**RATHERFORD UNIT #17-21
NW HORIZONTAL LATERAL **LEG #1**
1-C/1-D POROSITY BENCH
DESERT CREEK MEMBER
PARADOX FORMATION
SECTION 17, T41S, R24E
SAN JUAN, UTAH**

**GEOLOGY REPORT
by
JASON BLAKE
ROCKY MOUNTAIN GEO-ENGINEERING CORP.
GRAND JUNCTION, COLORADO
(970) 243-3044**

MICROFILM

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WELL SUMMARY

OPERATOR:	MOBIL EXPLORATION & PRODUCTION U.S. INC.
NAME:	RATHERFORD UNIT #17-21 NW HORIZONTAL LATERAL LEG #1 IN DESERT CREEK 1-C/1-D POROSITY BENCH
LOCATION:	SECTION 17, T41S, R24E
COUNTY/STATE:	SAN JUAN, UTAH
ELEVATION:	KB:4751' GL:4739'
SPUD DATE:	4/11/98
COMPLETION DATE:	4/17/98
DRILLING ENGINEER:	BENNY BRIGGS / SIMON BARRERA
WELLSITE GEOLOGY:	JASON BLAKE / MARVIN ROANHORSE
MUDLOGGING ENGINEERS:	JASON BLAKE / MARVIN ROANHORSE
CONTRACTOR:	BIG "A" RIG 25
TOOLPUSHER:	J. DEES
HOLE SIZE:	4 3/4"
CASING RECORD:	SIDETRACK IN WINDOW AT 5333' MEASURED DEPTH
DRILLING MUD:	M-I
ENGINEER:	DANNE BEASON
MUD TYPE:	FRESH WATER & BRINE WATER W/ POLYMER SWEEPS
DIRECTIONAL DRILLING CO:	SPERRY-SUN
ELECTICAL LOGGING:	NA
TOTAL DEPTH:	6662' MEASURED DEPTH; TRUE VERTICAL DEPTH-5558.87'
STATUS:	TOH & LAY DOWN TOOLS – PREPARE WELL FOR LEG #2

DRILLING CHRONOLOGY
RATHERFORD UNIT #17-21
1-C/1-D NW HORIZONTAL LATERAL LEG #1

DATE	DEPTH	DAILY	ACTIVITY
4/10/98	5410'	0'	Rig down @ Ratherford Unit #17-13. Move & rig up @ Ratherford Unit #17-21. Nipple up BOP. Pressure test. Rig up gas buster.
4/11/98	5410'	0'	P.U. D.C. & D.P. Strap & calibrate D.C.s. TIH w/ 2 7/8" D.P. Wash over packer @ 5245'. Latch onto packer. Displace hole w/brine. Flow well down. TOO H, nipple down grant head. Rig up Schlumberger wireline & run in hole. Rig down grant head. TIH w/window mill to wash & ream csg. Ream & wash out from 5410'-5506'. Circ btms up. TOO H, L.D. window mills.
4/12/98	5446'	0'	TOOH & L.D. mill assembly. R.U. wireline & RIH, set packer @ 5456'. POOH w/wireline & R.D. Schlumberger. Nipple up grant head & flow cross. Orient anchor latch assembly & TIH. Sting into packer @ 5456', packer sliding down hole @ 5529', work pipe. Unable to shear, pull uphole to 5425' & sheared off, push packer down to 5513'. TOO H. Nipple down flowline. Nipple up lubricator. TIH w/wireline packer & set. Nipple up grant head & flow cross. TIH w/anchor latch assembly. Break circ. Latch into anchor & RIH w/gyro. Check shot. Pull gyro. TOO H.
4/13/98	5333'	75'	M.U. whipstock & orient, TIH. Set whipstock & shear @ 5333'. Mill w/starter mill 5333'-5335'. TOO H w/starter mill. L.D. starter mill. M.U. window mills & TIH. Mill 5333'-5340'. Pump 10 bbl sweep & circ out. L.D. 15 jnts, TOO H, L.D. mills. P.U. curve assembly, orient & test, P.U. 14 jnts PH-6 & TIH. Swivel up, break circ to clear pipe. R.U. Gyro Data & TIH
4/14/98	5340'	176'	RIH w/gyro. Time drlg @ 2 min/inch from 5340'-5341'. Time drlg @ 1 min/inch from 5341'-5343'. Dir drlg w/wireline suveys to 5372'. Pull gyro RD Gyro Data. Dir drlg & suveys to 5516'.
4/15/98	5516'	188'	DIR DRLG & suveys to 5694' TD of curve. Pump sweep & circ out smpls. Lay down 49 jnts DP & TOH. Lay down curve motor assembly. Pick up lateral motor assembly & bit #2 and test. PU 48 jnts PH-6 tubing and trip in hole.
4/16/98	5694'	178'	Finish tripping in hole w lateral motor. Swivel up & break circ. Dir drlg and suveys 5496'-6489'.
4/17/98	6489'	795'	Dir drlg and suveys 6489'-6662' TD. Total depth reached at 1:30 PM. Pump 10 bbl sweep and circ out. POOH to casing and displace hole with brine. Finish TOH and lay down lateral motor assembly. Pick up retrieving hook and trip in hole.
4/18/95	6662'	0'	Finish tripping out of hole and lay down whipstock #1 assembly.

DAILY ACTIVITY

Operator: MOBIL

Well Name: RATHERFORD UNIT #17-21 NW 1-C/1-D HORIZONTAL LATERAL LEG #1

DATE	DEPTH	DAILY	DATE	DEPTH	DAILY
4/10/98	0'	0'			
4/11/98	0'	0'			
4/12/98	0'	0'			
4/13/98	5333'	7'			
4/14/98	5340'	176'			
4/15/98	5516'	188'			
4/16/98	5694'	178'			
4/17/98	6489'	795'			
4/18/98	6662'	0'			

BIT RECORD

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #17-21 NW 1-C/1-D HORIZONTAL LATERAL LEG #1

RUN	SIZE	MAKE	TYPE	IN/OUT	FTG	HRS	FT/HR
#1	4 3/4"	STC	MF-3P	5340'/	354'	37.5	9.4
(RR) #2	4 3/4"	STC	MF-3P	5694'/ 6662'	968'	31.0	31.2

MUD REPORT

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #17-21 NW 1-C/1-D HORIZONTAL LATERAL LEG #1

DATE	DEPTH	WT	VIS	PLS	YLD	GEL	PH	WL	CK	CHL	CA	SD	OIL	WTR
4/11/98	5525'	8.8	26	1	—	0/0	6.4	NC	NC	51K	12000	—	0%	100%
4/12/98	5349'	8.8	26	1	—	0/0	6.2	NC	NC	48K	9000	—	0%	100%
4/13/98	5349'	8.8	26	1	—	0/0	6.4	NC	NC	48K	7200	—	0%	100%
4/14/98	5385'	8.7	26	1	—	0/0	6.5	NC	NC	49K	6800	—	0%	100%
4/15/98	5608'	8.8	26	1	—	0/0	10.0	NC	NC	49K	6000	—	0%	100%
4/16/98	5886'	8.8	26	1	—	0/0	10.5	NC	NC	49K	4960	—	0%	100%
4/17/98	6565'	8.7	26	1	—	0/0	11.5	NC	NC	47.6K	4760	T R	4%	96%

SPERRY-SUN DRILLING SERVICES
SURVEY DATA

Customer ... : Mobil (Utah)
Platform ... : RATHERFOED UNIT
Slot/Well .. : BA25/17-21, 1A1

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	TVD	NORTHINGS FEET	EASTINGS FEET	VERTICAL SECTION	DOG LEG
5300.00	0.19	151.63	5299.80	15.66 S	27.76 E	-30.22	0.00
5333.00	0.26	297.96	5332.80	15.68 S	27.72 E	-30.20	1.31
5340.00	3.60	318.00	5339.79	15.51 S	27.56 E	-29.97	47.96
5360.00	10.20	323.90	5359.64	13.61 S	26.10 E	-27.57	33.15
5380.00	16.70	325.30	5379.08	9.81 S	23.42 E	-22.96	32.54
5400.00	22.10	325.90	5397.94	4.33 S	19.67 E	-16.38	27.02
5420.00	28.40	328.70	5416.02	2.86 N	15.08 E	-7.97	32.05
5440.00	33.00	332.00	5433.21	11.74 N	10.05 E	2.00	24.49
5460.00	36.60	331.80	5449.63	21.81 N	4.68 E	13.08	18.01
5480.00	39.90	330.70	5465.34	32.66 N	1.28 W	25.13	16.85
5500.00	45.60	330.00	5480.02	44.45 N	8.00 W	38.38	28.60
5520.00	50.00	329.30	5493.45	57.23 N	15.49 W	52.89	22.15
5540.00	53.00	327.90	5505.90	70.58 N	23.64 W	68.28	15.97
5560.00	56.40	327.70	5517.45	84.39 N	32.34 W	84.36	17.02
5580.00	61.60	328.10	5527.75	98.91 N	41.45 W	101.24	26.06
5600.00	66.00	328.00	5536.58	114.14 N	50.94 W	118.91	22.00
5620.00	71.00	327.60	5543.91	129.88 N	60.85 W	137.24	25.07
5640.00	76.20	327.10	5549.55	146.02 N	71.20 W	156.16	26.11
5660.00	80.80	326.60	5553.54	162.43 N	81.92 W	175.52	23.13
5694.00	90.40	323.60	5556.14	190.19 N	101.29 W	209.12	29.57
5727.00	90.00	319.90	5556.03	216.10 N	121.72 W	242.04	11.28
5758.00	89.60	319.10	5556.14	239.68 N	141.85 W	273.03	2.89
5790.00	90.40	319.30	5556.14	263.90 N	162.76 W	305.02	2.58
5822.00	89.90	318.90	5556.05	288.09 N	183.71 W	337.02	2.00
5854.00	89.30	318.20	5556.28	312.07 N	204.90 W	369.02	2.88
5885.00	90.50	318.20	5556.33	335.18 N	225.56 W	400.01	3.87
5917.00	90.40	317.90	5556.08	358.98 N	246.95 W	432.01	0.99
5948.00	89.90	317.50	5556.00	381.91 N	267.81 W	463.01	2.07
5980.00	89.20	316.80	5556.25	405.37 N	289.57 W	495.01	3.09
6012.00	89.70	317.00	5556.56	428.73 N	311.44 W	527.00	1.68
6043.00	89.40	316.10	5556.80	451.23 N	332.76 W	557.99	3.06
6075.00	88.80	315.60	5557.30	474.19 N	355.04 W	589.96	2.44
6106.00	89.70	314.70	5557.71	496.17 N	376.90 W	620.92	4.11
6138.00	90.70	314.50	5557.60	518.64 N	399.69 W	652.86	3.19
6170.00	90.80	314.70	5557.18	541.10 N	422.47 W	684.80	0.70
6202.00	89.80	315.20	5557.01	563.71 N	445.12 W	716.76	3.49
6233.00	89.60	316.70	5557.17	585.99 N	466.67 W	747.74	4.88
6265.00	89.60	316.80	5557.40	609.30 N	488.59 W	779.73	0.31

SPERRY-SUN DRILLING SERVICES
SURVEY DATA

Customer ... : Mobil (Utah)
Platform ... : RATHERFOED UNIT
Slot/Well .. : BA25/17-21, 1A1

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	TVD	NORTHINGS FEET	EASTINGS FEET	VERTICAL SECTION	DOG LEG
6297.00	90.20	316.10	5557.45	632.49 N	510.64 W	811.72	2.88
6328.00	89.50	317.40	5557.53	655.07 N	531.88 W	842.71	4.76
6360.00	86.40	316.50	5558.68	678.43 N	553.71 W	874.68	10.09
6392.00	85.70	316.80	5560.88	701.65 N	575.62 W	906.59	2.38
6423.00	86.00	317.40	5563.13	724.30 N	596.67 W	937.51	2.16
6454.00	88.20	318.80	5564.69	747.34 N	617.34 W	968.47	8.41
6486.00	90.10	318.40	5565.17	771.34 N	638.50 W	1000.46	6.07
6517.00	91.40	317.50	5564.76	794.36 N	659.26 W	1031.46	5.10
6549.00	91.80	318.40	5563.87	818.11 N	680.69 W	1063.44	3.08
6581.00	92.90	317.70	5562.56	841.89 N	702.06 W	1095.41	4.07
6613.00	93.30	318.10	5560.83	865.60 N	723.48 W	1127.37	1.77
6628.00	92.10	318.20	5560.12	876.76 N	733.48 W	1142.35	8.03
6662.00	92.10	318.20	5558.87	902.09 N	756.13 W	1176.33	0.00

THE DOGLEG SEVERITY IS IN DEGREES PER 100.00 FEET.
N/E COORDINATE VALUES GIVEN RELATIVE TO WELL HEAD.
TVD COORDINATE VALUES GIVEN RELATIVE TO WELL HEAD.
THE VERTICAL SECTION ORIGIN IS WELL HEAD.
THE VERTICAL SECTION WAS COMPUTED ALONG 318.00 (TRUE).
CALCULATION METHOD: MINIMUM CURVATURE.

6662 PROJECTED TO THE BIT

SAMPLE DESCRIPTIONS

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #17-21 NW 1-C/1-D HORIZONTAL LATERAL LEG #1

DEPTH	LITHOLOGY
5340.00 5350.00	LS ltbrn-ltbrngy-crm,occ brn,tan,ltgy-wh,crpxl-micxl-sl vfxl,rthy,arg,chky-sl anhy,tr tan CHT,v sl dol,tt-rr intxl POR,rr scat mod bri yel FLOR,no STN or CUT,tr thn SH blk,plty,frm,carb
5350.00 5360.00	LS,tn-brn,occ gr,vfn-crypnl,dens-slt/rthy,vsl foss ip,argil grd to CALC SLTSTN ip,brn-gr,sft,scat blk shl,scat lt tn-wht CHT;pr rthy POR,no vis STN,FLUOR or CUT
5360.00 5370.00	intrbd LS,tn-crm-brn,crypnl,dens,sl dolo ip w rr xln calc & argil LS grd to SLTSTN,gr-dk gr,fn xln/grn,rthy tex,no-pr rthy POR,no STN,FLUOR or CUT
5370.00 5380.00	LS,off wht-lt gr-tn,mic xln,sl chky-slt grny tex ip; infr pr intrxln/rthy POR,no STN,FLUOR or CUT
5380.00 5390.00	LS,off wht-crm-tn ip,mic-crypnl,sl dens xln-chky tex,scat xln anhy,rr lt gr CHT;no POR,STN,FLUOR or CUT
5390.00 5400.00	LS,tn-brn-crm,mic-crypnl,dens-chky ip,sl foss ip,abund lt tn transl CHT;no vis-vsl rthy POR,no vis STN,FLUOR or CUT
5400.00 5410.00	LS,crn-tn-lt brn ip,mic-crypnl,dens-sl chky/rthy tex,sl foss ip,abund lt tn-gr transl CHT;no-vsl intrxln/rthy POR,no vis STN,FLUOR or CUT
5410.00 5420.00	LS,crm-off wht aa + LS,lt gr-gr,fn-micxln,rthy,slty,argil,decr CHT aa;no-vpr vis POR,NFSOC
5420.00 5430.00	LS,crm-brn,mott,micxln,rthy-grny tex ip,sl foss,vsl anhy,argil,scat CHT,com blk sub tab SHL;pr intrxln POR,scat brn STN,spty FLUOR,sl strm-fr diff CUT
5430.00 5440.00	LS,off wht-crm-tn,vfn-mic xln,sub suc-grny tex-dns ip,foss ip,scat xln calc,sl argil ip,rr CHT;fr-occ fr intrxln POR,lt brn STN,spty mod yel FLUOR,sl strm-fr diff CUT
5440.00 5450.00	LS aa w sl show aa + incr LS,gr-dk gr,argil,sl foss grd to calc SLTSTN ip,scat blk tab SHL
5450.00 5460.00	LS m-ltbrn,m-ltgybrn,crm-wh,occ tan,dkbrn,mic-vfxl,crpxl,rthy-sl slty,intbd/shy carb mat & thn plty chky prtgs,anhy/tr xln ANHY incl,occ v arg,tr trns-ltan CHT,tr intxl POR,NFSOC
5460.00 5470.00	LS ltgybrn-tan,occcrm-wh,lt-mbrn,mic-vf-crpxl,sl shy,pred dns/thn chky-sl anhy plty prtgs,occ rthy-sl slty,tr dkbrn-occ tan CHT,rr arg strk,tt-rr intxl POR,NFSOC

DEPTH	LITHOLOGY
5470.00 5480.00	LS mgybrn-brn,occ dkbrn,rr crm,crpxl-micxl,sl vfxl,pred dns/slty prtgs & rr thn chky plty frag-incl,sl arg-sil ip/incr CHT AA,tt-v rr intxl POR,NFSOC
5480.00 5490.00	LS lt-mbrn,tan-crm,occdkbrn,wh,crpxl-micxl,occ vfxl,rhty-sl slty/thn chky-sl anhy plty prtgs,tr dns frag,tr trnsil CHT-sil incl,rr frac-pp vug POR,rr scat bri yel FLOR,no STN,fr v slow dif CUT,tr SH,blk,blky,carb
5500.00 5520.00	LS ltgy-wh,bcmg tan-crm/depth,micxl-vfxl-gran,occ crpxl,pred sl slty GRNST intbd/thn mot chky-sl anhy prtgs,tr vf gr QRTZ incl occ grdg to vf g SS/LS mtx,rr CHT AA,fr-p intxl POR,NFSOC
5520.00 5530.00	SH dkbrn-brnblk-blk,sbblky-sbplty-irreg,frm-mod sft-occ brit,sl dol-cal,tr pp mica incl,carb,sooty
5530.00 5540.00	SHL,dk brn-occ dk gr/blk,sbblky-sub tab ip,pred sft,slty,calc-occ sl frm-occ brtt,scat micro pyr,NFSOC
5540.00 5550.00	minor SHL aa + LS,lt gr,vfn-micxln,argil,grny-slty tex & LS,tn-brn,mic-crypdxln,dens;pr intrxln POR,no vis STN,spty FLUOR,sl resid rng CUT
5550.00 5560.00	LS GRNSTN,tn-brn,vfn-micxln,ool,sl anhy,scat LS PKSTN,crm-tn,micxln,dens;fr-gd oomold-intrxln POR,fr brn STN,mod yel-gld FLUOR,fr strm-diff bloom CUT,fr ODOR & sl FO in smp
5560.00 5570.00	LS GRNSTN aa,ool w shows aa + incr LS PKSTN,crm-tn,mic-crypdxln,dens-sl chky ip,pr intrxln POR,sl dk brn-blk STN,even mod yel-gld FLUOR,fr strm-diff CUT
5570.00 5590.00	pred LS PKSTN,crm-tn,mic-crypdxln,dens-sl chky ip,pr-no intrxln POR,spty dk brn-blk STN,sl dull yel-gld FLUOR,sl CUT, scat LS GRNSTN aa
5590.00 5600.00	LS PKSTN aa,crm-tn,mic-crypdxln,dens-sl chky ip,pr-no intrxln POR,spty dk brn-blk STN,sl dull yel-gld FLUOR,sl CUT, scat LS GRNSTN,tn-lt brn,vfn xln,sl suc-grny tex;pr intrxln POR,brn STN,fr FLUOR & CUT
5600.00 5610.00	LS GRNSTN,tn-lt brn,vfn-mic xln,sub suc-grny tex,ool,sl anhy; fr introol/intrxln-scat oomold POR,even lt brn-brn STN,even dul-mod yel gld FLUOR,fr-gd strm-bloom CUT
5610.00 5630.00	LS,crm-tn-lt brn,vfn-mic xln,dens-sl chky/grny tex ip,sl foss ip,scat ool,scat anhy,rr blk shl & carb incl;pr intrxln POR,spty dk brn-rr blk STN,spty dull yel FLUOR,sl CUT
5630.00 5640.00	LS,crm-tn-brn,mic-crypdxln,dens-sl chky & intrbd DOLO LS,brn-dk brn,micxln,mic suc ip,sl argil,sl foss,anhy,scat xln calc;no-sl intrxln POR,no vis STN,sl dull FLUOR,sl strm-resid CUT

DEPTH	LITHOLOGY
5640.00 5650.00	intrbd LS & DOLO LS aa,crm-tn-brn-dk brn/gr,vfn-mic-crypnl,dens-sl slty/grny tex ip,sl argil;pr-no shows aa
5650.00 5660.00	DOLO LS grd to DOLO,lt brn-hon brn,occ crm-tn,mic-vfnln,suc tex-dens ip,scat xln calc,anhy,scat tn CHT;pr-fr intrxln POR,pr brn STN,vdull FLUOR,vsl CUT
5660.00 5680.00	DOLO,occ sl calc,md hon brn,fn-vfnln,sub suc tex,scat xln anhy incl,scat foss (crin)rem;printrxln POR,even pr brn STN,even dull yel FLUOR,sl strm-diff CUT
5680.00 5694.00	DOL brn-ltbrn,vfxl-micsuc,pred GRNST,sl lmy occ grd to dol LS,POR-FLOR-STN-CUT AA,intbd/LS GRNST,ltgybrn-ltgy-wh,vfxl-micxl-gran,occ chky-sl anhy,tt-fr intxl POR/tr POR fl,fr dull yel FLOR,fr-tr ltbrn/rr brn STN,p-fr dif CUT
5694.00 5700.00	SMPL LAT pred DOL AA/scat-intbd LS AA,POR-FLOR-STN- CUT AA,tr blk-dkbrnblk SH & dkbrn CHT cvgs
5700.00 5710.00	DOL brn-ltbrn,vfxl-micsuc,pred GRNST,sl lmy occ grd to dol LS,fr-g intxl POR,FLOR-STN-CUT AA,intbd/LS GRNST AA,vfxl-micxl-gran,occ chky-sl anhy,fr intxl POR/tr POR fl,fr dull yel FLOR,fr ltbrn-tr brn STN,p-fr dif CUT
5710.00 5720.00	DOL AA/sl incr LS GRNST AA,POR-FLOR-STN CUT AA
5720.00 5740.00 5721.94	0 "DOLO & CALC DOLO GRNSTN,occ DOLO LS,med hon brn-brn,occ crm-tn,fn-vfn-occ mic xln,suc-grny tex,scat anhy incl,rr foss rem (poss crin); fr intrxln POR,pr even brn STN,even dull yel FLUOR,sl strm-gd resid rng CUT,sl ODOR & FO in smp
5740.00 5750.00	DOLO GRNSTN,calc ip,brn-occ dk brn,vfn-fn grn,suc-grny tex,bcm sl algal,scat anhy incl;fr intrxln POR,brn STN,even dull FLUOR,sl-fr strm-gd resid CUT
5750.00 5770.00	DOLO GRNSTN,sl calc ip,brn-occ dk brn,vfn-fn xln,suc-grny tex,sl anhy,algal;fr intrxln POR,pr-fr brn-dk brn STN,even dull yel-gld FLUOR,sl strm-gd resid CUT,fr ODOR & sl FO in smp
5770.00 5780.00	DOLO GRNSTN,calc ip,brn-occ dk brn,bcm hon brn-more calc ip,vfn-fn grn,suc-grny tex,sl algal,scat anhy incl;fr intrxln POR,brn STN,even dull FLUOR,sl-fr strm-gd resid CUT
5780.00 5800.00	DOLO GRNSTN,sl calc,pred hon brn-brn,vfn-mic xln,suc-grny tex,poss sl foss ip;pr intrxln-occ ppt vug POR,pr brn STN,sl decr dull yel-gld FLUOR,sl strm-gd resid CUT,sl decr ODOR & FO in smp
5800.00 5820.00	DOLO GRNSTN grd to DOLO LS ip,hon brn-brn,vfn-fn xln,grny-suc tex,scat anhy incl,rr lt gr transl CHT;fr-gd intrxln POR,pr brn STN,even dull yel FLUOR,even dull yel FLUOR,sl strm-diff CUT,incr ODOR & FO in smp

DEPTH	LITHOLOGY
5820.00 5840.00	DOLO GRNSTN grd to DOLO LS ip,hon brn-brn,vfn-fn xln,grny-suc tex,scat anhy incl,rr lt gr transl CHT;fr-gd intrxln POR,pr-fr brn STN,even dull yel FLUOR,even dull yel FLUOR,sl strm-diff CUT,gd ODOR & incr FO in smp
5840.00 5860.00	CALC DOLO & DOLO LS,lt hon brn-brn,occ dk brn,fn-vfn xln,wl dev suc-grny tex,scat anhy incl,scat lt tn-crm LS,scat xln calc;fr-gd intrxln POR,fr brn-dk brn STN,even dull-mod yel-gld FLUOR,sl-fr strm-diff bloom CUT,gd ODOR & fr FO in smp
5860.00 5880.00	CALC DOLO GRNSTN grd to DOLO LS ip,hon brn-brn,occ dk brn,vfn-fn xln,grny-suc tex,scat anhy incl,scat xln calc,rr blk carb incl;fr-gd intrxln POR,pr-fr brn STN,even dull yel FLUOR,even dull yel FLUOR,sl strm-diff CUT,gd ODOR & abund FO in smp
5880.00 5900.00	CALC DOLO & DOLO LS,lt hon brn-brn,occ dk brn,fn-vfn xln,wl dev suc-grny tex,scat anhy incl,scat lt tn-crm LS,scat xln calc;fr-gd intrxln POR,fr brn-dk brn STN,even dull-mod yel-gld FLUOR,sl-fr strm-diff bloom CUT,gd ODOR & abund FO in smp
5900.00 5920.00	CALC DOLO & DOLO LS aa,lt hon brn-brn,occ dk brn,fn-vfn xln,wl dev suc-grny tex,sl algal-foss,scat anhy incl,scat lt tn-crm-gr LS,scat xln calc;fr-gd intrxln POR,fr brn-dk brn STN,even dull-mod yel-gld FLUOR,sl-fr strm-diff bloom CUT,gd ODOR & FO in smp
5920.00 5940.00	pred DOLO GRNSTN grd to DOLO LS ip,hon brn-brn,occ dk brn,vfn-fn xln,grny-suc tex,algal/foss,scat anhy incl,scat xln calc,rr blk carb incl;fr-gd intrxln POR,pr-fr brn STN,even mod yel FLUOR,even dull yel FLUOR,sl strm-diff CUT,gd ODOR & abund FO in smp
5940.00 5960.00	DOLO & DOLO LS aa,lt hon brn-brn,occ dk brn,fn-vfn xln,wl dev suc-grny tex,scat anhy incl,scat lt tn-crm LS,scat xln calc;fr-gd intrxln POR,fr brn-dk brn STN,even dull-mod yel-gld FLUOR,sl-fr strm-diff bloom CUT,gd ODOR & abund FO in smp
5960.00 5980.00	pred DOLO GRNSTN,scat ltgr DOLO LS,hon brn-brn,occ dk brn,vfn-fn xln,grny-suc tex,algal/foss,scat anhy incl,scat xln calc,rr blk carb incl;fr-gd intrxln POR,pr-fr brn STN,even mod yel FLUOR,even dull yel FLUOR,sl strm-diff CUT,gd ODOR & abund FO in smp
5980.00 6000.00	DOLO & DOLO LS aa,lt hon brn-brn,occ dk brn,fn-vfn xln,wl dev suc-grny tex,sl algal-foss,scat anhy incl,scat lt tn-crm-gr LS,scat xln calc;fr-gd intrxln POR,fr brn-dk brn STN,even dull-mod yel-gld FLUOR,sl-fr strm-diff bloom CUT,gd ODOR & FO in smp
6000.00 6020.00	pred DOLO GRNSTN,sl DOLO LS aa,hon brn-brn,occ dk brn,vfn-fn xln,grny-suc tex,algal/foss,scat anhy incl,scat xln calc,rr blk carb incl;fr-gd intrxln-occ vug POR,fr brn STN,even mod yel FLUOR,even dull yel FLUOR,fr strm-diff CUT,gd ODOR & abund FO in smp
6020.00 6040.00	pred DOLO GRNSTN,med brn-brn,occ dk brn,vfn-fn xln,grny-suc tex,algal/foss,scat anhy incl,scat xln calc,rr blk carb incl;fr-gd intrxln-occ ppt vug POR,pr-fr brn STN,even mod yel FLUOR,fr strm-diff CUT,gd ODOR & abund FO in smp

DEPTH	LITHOLOGY
6040.00 6060.00 DOLO GRNSTN aa,bcm more calc,med brn-brn,occ dk brn,fn-vfn xln,wl dev suc-grny tex,poss sl algal,foss(crin),scat anhy incl,scat xln calc;fr-gd intrxln POR,fr brn-dk brn STN,even dull-mod yel-gld FLUOR,sl-fr strm-diff bloom CUT,gd ODOR & FO in smp	
6060.00 6080.00 CALC DOLO aa,med brn-brn,occ dk brn,fn-vfn xln,wl dev suc-grny tex,scat anhy incl,scat xln calc,sl algal,foss(crin);fr-gd intrxln POR,fr brn-dk brn STN,even mod yel-gld FLUOR,fr-gd strm-diff bloom CUT,gd ODOR & abund FO in smp	
6080.00 6100.00 CALC DOLO,med brn-brn,occ dk brn,fn-vfn xln,wl dev suc-grny tex,scat anhy incl,scat xln calc,sl algal,foss(crin);fr-gd intrxln POR,fr brn-dk brn STN,even mod yel-gld FLUOR,fr-gd strm-diff bloom CUT,gd ODOR & abund FO in smp	
6100.00 6120.00 CALC DOLO grd to DOLO LS,med brn-brn,occ dk brn,occ tn,fn-vfn xln,suc-grny tex,scat anhy incl,scat xln calc,sl algal,sl foss(crin);fr-gd intrxln POR,fr brn-dk brn STN,even mod yel-gld FLUOR,fr-gd strm-diff bloom CUT,gd ODOR & abund FO in smp	
6120.00 6140.00 CALC DOLO grd to DOLO LS aa,med brn-brn,occ tn-dk brn,fn-vfn xln,suc-grny tex,scat anhy incl,scat xln calc,sl algal,sl foss(crin);fr-gd intrxln POR,fr brn-dk brn STN,even mod yel-gld FLUOR,fr-gd strm-diff bloom CUT,gd ODOR & abund FO in smp	
6140.00 6160.00 pred DOLO GRNSTN,med brn-brn,occ dk brn,vfn-fn xln,grny-suc tex,sl algal/foss,scat anhy incl,scat xln calc,rr blk carb incl;fr-gd intrxln POR,pr-fr brn STN,even mod yel FLUOR,fr strm-diff CUT,gd ODOR & abund FO in smp	
6160.00 6180.00 DOLO GRNSTN aa,med brn-brn,occ dk brn,fn-vfn xln,wl dev suc-grny tex,poss sl algal&foss,scat anhy incl,scat xln calc;fr-gd intrxln POR,fr brn-dk brn STN,even dull-mod yel-gld FLUOR,sl-fr strm-diff bloom CUT,gd ODOR & FO in smp	
6180.00 6200.00 DOLO GRNSTN,med brn-brn,occ dk brn,vfn-fn xln,grny-suc tex,sl algal/foss,scat anhy incl,scat xln calc,rr blk carb incl;fr-gd intrxln POR,pr-fr brn STN,even mod yel FLUOR,fr strm-diff CUT,gd ODOR & abund FO in smp	
6200.00 6220.00 CALC DOLO,med brn-brn,occ dk brn,fn-vfn xln,wl dev suc-grny tex,scat anhy incl,scat xln calc,sl algal,sl foss;fr intrxln POR,fr brn-dk brn STN,even mod yel-gld FLUOR,fr-gd strm-diff bloom CUT,fr ODOR & decr FO in smp	
6220.00 6240.00 DOLO GRNSTN,med brn-brn,occ dk brn,vfn-fn xln,grny-suc tex,sl algal/foss,scat anhy incl,scat xln calc,rr blk carb incl;fr-gd intrxln POR,pr-fr brn STN,even mod yel FLUOR,fr strm-diff CUT,gd ODOR & fr FO in smp	
6240.00 6260.00 DOL m-ltbrn,occ dkbrn,gran-suc-micsuc,occvfxl-micxl,pred v sl calc DOL GRNST/occ lmy strk & grdg to LS GRNST,tr LS crm-tan,crpxl,prob CRIN fos incl,v rr trnsf-clr CALC xl incl,fr-mod g intxl POR,g even mod bri yel FLOR,g brn/occ dkbrn STN,g mod fast stmg mlky CUT	

DEPTH	LITHOLOGY
6260.00 6280.00	LS lt-mbrn,occ brn,tr tan,gran-vfxl-micxl,occ micsuc-suc,v sl dol GRNST/scat m-dkbrn calc DOL GRNST/tr scat ltgy slty-sl sil DOL prtgs,tr trnsi-clr-wh CHT,sl chky/tr POR fl,fr-g intxl POR,FLOR-STN-CUT AA
6280.00 6290.00	DOL lt-mbrn,occ ltgy,vfxl-gran,micsuc-suc,occ crpxl,pred calc-lmy GRNST grdg to dol LS,intbd in LS AA,fr-g intxl POR/tr chky POR fl,fr mod bri yel FLOR,fr-g ltbrn/tr brn STN,CUT AA
6290.00 6310.00	DOL lt-mbrn,occ dk brn,tr ltgy,gran-vfxl-micsuc,occ micxl-suc-crpxl,GRNST/tr dol LS prtgs,sl chky/tr POR fl,tr scat dns sil & trnsi-clr-wh CHT frag,rr CRIN,POR-FLOR-STN AA,fr-g slow-mod fast stmg CUT,w/tr LS AA
6310.00 6330.00	LS lt-mbrn,occ brn,tr tan,gran-vfxl-micsuc,occ sl suc,pred dol LS GRNST,occ sl slty-arg ip,fr-g intxl POR,g even dull-mod bri yel FLOR,STN-CUT AA,w/scat DOL GRNST AA,tr CHT AA,sl chky/tr POR fl,fr-g intxl POR,FLOR-STN-CUT AA
6330 6360.00	DOL lt-mbrn,occ dk brn,tr ltgy,gran-vfxl-micsuc,occ micxl-suc-crpxl,sl calc GRNST/tr dol LS prtgs,sl chky/tr POR fl,tr scat dns sil & trnsi-clr-wh CHT frag,sl incr CRIN fos,v sl agal,fr-g intxl POR,FLOR-STN AA,fr-g slow-mod fast stmg/tr mlky CUT
6360.00 6370.00	LS lt-mbrn,occ brn,tr tan,gran-vfxl-micsuc,occ sl suc,pred dol LS GRNST,occ sl slty-arg ip,tr CHT AA,fr-g intxl POR,g even dull-mod bri yel FLOR,STN-CUT AA,intbd in DOL AA
6370.00 6400.00	DOL m-dk brn,occ ltbrn,tr ltgy,vfxl-crpxl,sl micxl-micsuc-gran,calc-lmy DOL GRNST,intbd/dol GRNST LS & thn plty chky prtgs/tr POR fl,tr CHT AA,rr CRIN,fr-g intxl POR,fr dull/tr mod bri yel FLOR,STN AA,fr-g slow-mod fast stmg mlky CUT
6400.00 6420.00	LS m-ltbrn,occ tan-crm,dkbrn,gran-micsuc-vfxl,occ suc,pred sl dol LS GRNST intbd/calc-lmy DOL GRNST & ltgy sil-arg dol prtgs,sl chky/tr intxl POR,tr CRIN fos,rr wh-trnsi CHT,fr intxl POR,g even dull-mod bri yel FLOR,fr-g brn/tr dkbrn STN,g mod fast-slow mlky dif CUT
6420.00 6440.00	DOL AA,vfxl-crpxl-gran,micxl-sl micsuc,DOL GRNST sl calc-lmy ip,occ sil-arg,tr intbd dol GRNST LS AA,tr CHT AA,rr CRIN,fr intxl POR,g even dull-sl mod bri yel FLOR,STN AA,fr slow dif/v fnt res ring CUT
6440.00 6470.00	LS lt-mbrn,occ tan-crm,rr dkbrn,gran-micsuc-vfxl,occ suc,sl dol LS GRNST intbd/DOL GRNST AA & ltgy sil-arg dol prtgs,v sl chky,tr CRIN fos,sl incr CHT AA,rr thn plty ltgy mot-arg frag,fr intxl POR,FLOR-STN AA,g slow stmg mlky CUT
6470.00 6490.00	DOL AA,vfxl-crpxl-gran,micxl-sl micsuc,DOL GRNST sl calc-lmy ip,occ sil-arg,tr intbd dol GRNST LS AA,incr thn m-ltgy mot arg frag,tr CHT AA,rr CRIN,fr intxl POR,fr-g scat dull yel FLOR,fr-g ltbrn/tr brn STN,fr slow dif/v fnt res ring & rr slow stmg CUT

DEPTH	LITHOLOGY
6490.00 6510.00	DOLO,med brn-brn,vfn xln,mic suc-grny tex,sl anhy (cvgs?, DOLO grd to DOLO LS ip,off wht-lt gr-tn,mic-crypXln,dens-cky to grny tex,sl foss (crin);pr-fr intrXln-ppt vug POR in brn DOLO,dk brn STN,dull FLUOR,sl strm-diff CUT,no POR in lt gr-tn DOLO LS
6510.00 6530.00	DOLO,med brn-brn,sub suc aa w shows aa + incr DOLO grd to DOLO LS,off wht-lt gr,mottled,abund flky bit gouge,mic-crypXln,dens chky to slty tex,sl argil; no vis POR,STN or CUT in wht-lt gr mat, scat blk shl"
6530.00 6550.00	fine grnd smp,abund lt gr,mottled,chky/rthy DOLO,micXln,plty (bit gouge),argil ip,anhydritic + DOLO,lt brn-tn,vfn xln,suc/grny tex,com loose dolo grns;infer fr intrXln POR ip, no vis STN,spty dull yel FLUOR,fr stm CUT(from oil cont in smp)
6550.00 6570.00	abund DOLO,lt gr,mottled,chky/rthy,micXln,plty (bit gouge),argil ip,anhydritic + DOLO,lt brn-tn,vfn xln,suc/grny tex,com loose dolo grns;infer fr intrXln POR ip, no vis STN,spty dull yel FLUOR,fr stm CUT(from oil cont in smp)
6570.00 6590.00	DOLO GRNSTN aa,tn-brn,vfn xln,suc/grny tex,poss sl foss ip + abund DOLO,lt gr,sft,argil,plty (bit gouge),anhydritic;grnstn w pr-fr intrXln POR(prob anhy filled),pr STN,dull yel FLUOR,sl strm-diff CUT
6590.00 6600.00	LS grd to DOLO LS,crm-tn-lt brn,mic-crypXln,pred dens xln mtrX-sl chky ip,poss sl foss ip + DOLO,tn-brn-gr aa,grny to chky,argil ip aa:pr intrXln POR,spty brn STN,spty dull yel FLUOR,sl strm-diff CUT(smgs oil contaminated from system)
6600.00 6620.00	incr LS grd to DOLO LS,crm-tn-lt brn,mic-crypXln,pred dens xln mtrX-sl chky ip,poss sl foss ip + decr DOLO,tn-brn-gr aa,grny to chky,argil ip aa:pr intrXln POR,spty brn STN,spty dull yel FLUOR,sl strm-diff CUT aa
6620.00 6640.00	incr DOLO,tn-brn,vfn xln,suc/grny tex,sl anhy,DOLO LS,off wht-crm-occ tn,mic-occ crypXln,dens-chky/sl grny tex ip,anhy;pr intrXln POR,prob anhy filled,pr spty brn STN,spty dull yel-gld FLUOR,sl strm-diff CUT
6640.00 6662.00	DOLO,tn-brn aa,vfn xln,suc/grny tex,sl anhy + DOLO LS,off wht-crm-occ tn,mic-occ crypXln,dens-chky/sl grny tex ip,anhy;pr intrXln POR,prob anhy filled,pr spty brn STN,spty dull yel-gld FLUOR,sl strm-diff CUT

FORMATION TOPS

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #17-21 NW 1-C/1-D HORIZONTAL LATERAL LEG #1

FORMATION NAME		SAMPLE MEASURED DEPTH	SAMPLE TRUE VERTICAL DEPTH	DATUM KB:4751'
UPPER ISMAY		5359'	5358'	-607'
LOWER ISMAY		5430'	5425'	-674'
GOthic SHALE		5520'	5494'	-743'
DESERT CREEK		5545'	5508'	-756'
DC 1-A ZONE		5549'	5511'	-760'
DC 1-B ZONE		5603'	5537'	-786'
DC 1-C ZONE		5658'	5553'	-802'
TOP DC 1-C ZONE @ 716' VS		6200'	5557'	-806'
BASE DC 1-C ZONE @ 954' VS		6440'	5564'	-813'
TOP DC 1-C ZONE @ 1162' VS		6648'	5559'	-808'

GEOLOGICAL SUMMARY

AND

ZONES OF INTEREST

The Mobil Exploration and Production U.S., Inc., Ratherford Unit #17-21 Northwest Horizontal Lateral Leg #1 was a re-entry of the Mobil Ratherford Unit #17-21 located in Section 17, T41S, R24E, and was sidetracked in a northwesterly direction from a 5340' measured depth, 5339.79' true vertical depth, on April 13, 1998. The lateral reached a measured depth of 6662', true vertical depth of 5558.87' at total depth, with a horizontal displacement of 1176.33' and true vertical plane 318.2 degrees on April 17, 1998 in the upper Desert Creek 1-C porosity zone. During the initial preparation of the wellbore, due to bad casing, difficulty was experienced setting the oriented packer. The packer was finally set at 5349' instead of 5456' as originally planned. This necessitated setting the whipstock for lateral #1 about 100 feet higher than called for in the drilling plan, resulting in a curve radius of 217 feet.

The curve section of the hole was drilled with no problems from a measured depth of 5340' to 5654'. The curve was landed at a true vertical depth of 5556.3', in the 1-C porosity zone of the Desert Creek on April 5, 1998. Because the lateral was started higher than anticipated, the curve section of the hole penetrated the lower portion of the Paradox lime and the Paradox Shale before encountering the typical section of Upper Ismay, Lower Ismay, Gothic Shale and Desert Creek.

Objectives of the Ratherford Unit #17-21 leg #1 horizontal lateral were to penetrate and drill the 1-C porosity horizon and to transition down into the 1-D horizon of the Desert Creek member of the Paradox Formation toward the end of the lateral as it approached the RU #8-14 target well. Additional objectives were to identify and define the lithology and evaluate the porosity and effective permeability of the 1-C and 1-D benches of the Desert Creek. These objectives were accomplished in the 1-C zone with a considerable section of very consistent lithology with good shows being penetrated. After completing the curve section of the lateral, the lateral section required intermittent sliding to maintain vertical and horizontal plane direction. The well path essentially followed the proposed target line until the 1-C zone thinned out. Both the top and bottom of the zone were encountered near the end of the lateral which was TD'd at the top of the 1-C zone. The lateral section of the hole was terminated 317 feet prematurely due to decreased zone thickness and anhydrite porosity plugging in the 1-C zone without penetrating the 1-D porosity zone.

The lowermost portion of the Paradox Limestone was penetrated when drilling the first twelve feet of the curve section. The lithology was a limestone, light brown to light gray brown to cream, microcrystalline to cryptocrystalline to occasionally very fine crystalline, earthy and slightly argillaceous with a slightly chalky texture. The limestone was slightly anhydritic with a trace of tan translucent chert. The zone exhibited very poor to no intercrystalline porosity, no visible staining or cut, but did show scattered bright yellow fluorescence which was most likely pipe dope contamination. The Paradox Shale marker between the Paradox Lime above and the Upper Ismay below was represented by brown to gray siltstone which was soft and calcareous in nature plus scattered black shale, sub tabular, slightly firm with a brown streak.

The top of the Upper Ismay was encountered at a measured depth of 5359', true vertical depth of 5359'. The upper 21 feet from 5359' to 5380' measured depth was characterized by interbedded limestone and argillaceous limestone grading to siltstone in part. The limestone was tan to cream to brown, cryptocrystalline, dense and slightly dolomitic with rare crystalline calcite. The argillaceous limestone was gray to dark gray in color, fine crystalline with an earthy to grainy texture grading to a calcareous siltstone in part. This interval had very poor earthy to no visible intercrystalline porosity, no stain and displayed no fluorescence or cuts. The remainder of the Upper Ismay from 5380' to the Hovenweep marker at 5426' measured depth (5379'-5421' TVD) displayed a fairly consistent lithology, being limestone, cream to tan to brown, microcrystalline to cryptocrystalline, with a predominately dense to chalky texture in part, scattered fossils and abundant light tan translucent chert. This interval had poorly developed intercrystalline porosity in part with no visible staining and no fluorescence or cuts. The Hovenweep marker between the Upper and Lower Ismay members was represented by a thin interval of black shale which was sub tabular, moderately firm, slightly calcareous with a brown to gray streak.

The top of the Lower Ismay was picked at 5430' measured depth, 5425' true vertical depth, at the base of the thin Hovenweep shale marker. This pick was based on sample identification and an increase in penetration rate. The upper 40 feet of the Lower Ismay from 5425' to 5465' measured depth was predominately limestone, white to cream to tan in color, very fine crystalline to microcrystalline with a sub sucrosic to grainy texture grading to a dense tight matrix in part. The zone was fossiliferous in part with scattered crystalline calcite; rare tan chert fragments and was slightly argillaceous in part. Thin interbeds of gray to dark gray very argillaceous fossiliferous limestone and interbedded calcareous siltstones were also present through this interval. Minor light brown staining was noted in occasionally fair developed intercrystalline porosity with spotty moderate yellow fluorescence and an associated slow streaming to fair diffused cut. A thin 10 to 15 foot interval from 5465' measured depth to 5481' measured depth showed an increase in dark brown to occasional tan chert in a light gray brown to tan, microcrystalline to cryptocrystalline limestone. A fairly consistent lithology was noted through the lower portion of the Lower Ismay from 5481' to the top of the Gothic at 5520' measured depth. This portion of the section was predominately varicolored limestone, being light brown to brown to tan to cream and occasionally off white to white. The texture was mainly microcrystalline to cryptocrystalline, slightly silty to chalky in part with scattered platy anhydrite partings and was slightly siliceous in part with scattered light colored translucent chert. A trace of very fine quartz inclusions grading to very thin calcareous sandstones was logged near the base of the section. Minor fracture to pin point vuggy porosity was noted in part, but no visible staining was noted. Minor scattered bright yellow fluorescence and very slow diffused cuts were associated with the porous areas.

The Gothic Shale was penetrated at a measured depth of 5520', 5494' true vertical depth, and was the typical lithology; predominantly dark brown to black to dark gray black shale, carbonaceous, silty, soft to slightly firm, subblocky to slightly tabular, calcareous to slightly dolomitic and slightly micaceous, with scattered micro pyrite. The top of the Gothic was appeared to be somewhat gradational from the thin interbedded argillaceous limestones and calcareous siltstones at the base of the Lower Ismay to the dolomitic to calcareous carbonaceous shale. The top of the Gothic was picked predominantly by an increase in penetration rate and an abrupt increase in the percentage of shale in the samples.

The top of the Desert Creek member of the Paradox was marked by a thin transition zone facies between the overlying Gothic Shale and the underlying 1-A porosity zone. This thin interval in this lateral was the typical transition zone lithology, being thin inter-beds of light gray limestone, very fine crystalline to microcrystalline and argillaceous with a grainy to silty texture and tan to brown limestone, microcrystalline to cryptocrystalline with a dense matrix. This zone displayed only poorly developed intercrystalline porosity with no visible staining, spotty dull to moderate yellow fluorescence and only slight residual ring cuts.

The top of the Desert Creek 1-A porosity zone was encountered at a measured depth of 5549', true vertical depth of 5511', essentially flat with the top on the vertical well log. The top was noted by a significant increase in the penetration rate and a change into the typical oolitic limestone grainstone displaying oomoldic porosity development. The limestone was tan to brown in color, very fine crystalline to microcrystalline, oolitic and slightly anhydritic with fair to good oomoldic and intercrystalline porosity development, fair brown stain, moderate yellow gold fluorescence and fair streaming to diffused cuts. Thin interbeds of limestone packstones were present though the 1-A porosity zone and were cream to tan in color, microcrystalline with a dense tight to slightly chalky texture. The packstones displayed only minor shows at best. The 1-A porosity zone was about 15 feet thick in this lateral and appeared to become somewhat less porous with depth. This corresponds with 16 foot thick porosity seen on the gamma neutron log.

A tight limestone packstone was penetrated from the base of the 1-A porosity zone at 5578' measured depth (5526' TVD) to the top of the 1-B horizon at 5603' measured depth. This interval was characterized by a tight limestone packstone, cream to tan in color, microcrystalline to cryptocrystalline with a dense to slightly chalky micritic matrix and was slightly anhydritic. No fossils or chert were observed in this section. Only poor spotty intercrystalline porosity development was noted in this packstone interval with spotty dark brown to black stain, spotty dull yellow gold fluorescence and slow streaming to residual ring cuts.

The 1-B porosity horizon was penetrated from a measured depth of 5549' down to about 5620'. This corresponds to a true vertical depth of 5537' to 5544'. The top of the porosity was within 2 feet of the top shown on the well log for the vertical well. The porosity development on the vertical well log also appears to be about 7 feet thick. The best porosity was only about 3 feet thick from a TVD of 5537' to 5540'. The lithology of the 1-B porosity zone was a limestone grainstone, tan to light brown, very fine crystalline to microcrystalline with a sub sucrosic to grainy texture, oolitic and slight anhydritic with fair interoolitic to intercrystalline porosity. Scattered reduced oomoldic porosity was also observed and shows were fair to good with even light brown to brown stain, even dull to moderate yellow fold fluorescence and fair to good streaming to bloom cuts.

The interval between the base of the 1-B porosity to the top of the 1-C porosity zone was a limestone packstone grading to a dolomitic limestone just above the 1-C horizon, cream to tan to brown and occasionally dark brown in color, microcrystalline with a microsucrosic texture in part and was slightly argillaceous, slightly fossiliferous and occasionally anhydritic with scattered crystalline calcite. Porosity development through this interval was generally poor intercrystalline with no visible staining, scattered dull yellow fluorescence and very slight streaming to residual cuts in part.

The 1-C objective horizon was penetrated at a measured depth of 5658', true vertical depth of 5553', essentially flat to the top shown on the gamma-neutron log for the vertical well. The lithology of the 1-C when first penetrated was primarily a dolomite grainstone, light to medium honey brown in color, very fine crystalline to fine crystalline with a sucrosic to grainy texture. The uppermost portion of the interval was characterized by scattered tan chert and scattered crystalline calcite and was slightly anhydritic in part. The curve portion of the hole was landed at a measured depth of 5694', true vertical depth of 5556', essentially right on the target depth and 3 feet (vertically) into the 1-C porosity.

From the beginning of the lateral section to a measured depth of 6440' the lithology of the zone remained quite consistent with only minor variations in the dolomite/limestone ratios. The lithology was primarily a dolomite grainstone grading occasionally to a dolomitic limestone, medium brown to brown, fine crystalline to very fine crystalline with a sucrosic to grainy texture. Scattered anhydrite inclusions, scattered crystalline calcite and rare black carbonaceous inclusions were noted in places. Scattered fossils including crinoids and possibly bryozoans, plus scattered algal material and scattered clear to white chert fragments were also noted within the 1-C horizon. Porosity was generally fair to good, being primarily intercrystalline with scattered pinpoint vuggy development.

Shows within this zone started out fair with poor to fair brown to dark brown stain, even dull yellow fluorescence and a slow to fair streaming cut with a good residual ring cut. As the horizon was penetrated farther away from the original well bore, shows improved to fair to good with fair to good brown staining, even moderate yellow gold fluorescence and fair to good streaming to diffused bloom cuts.

From where the 1-C zone was first penetrated, background gas readings stayed in the range of about 500 to 600 units with a large component of C1. Beginning at a measured depth of 5850' and remaining through the remainder of the lateral, background gas reading increased significantly. Readings went almost instantaneously from the 500-600 unit range to the 4000 to 5000 unit range even after going through the gas buster with a higher component of C2-C4 gasses. The remainder of the lateral was drilled with a 10 to 30 foot flare and the well made a considerable amount of clean, light gassy oil while drilling. This depth of 5850' is interpreted to represent the extent of the flushed zone from the #17-21 vertical well and corresponds to a horizontal displacement distance of 360 feet.

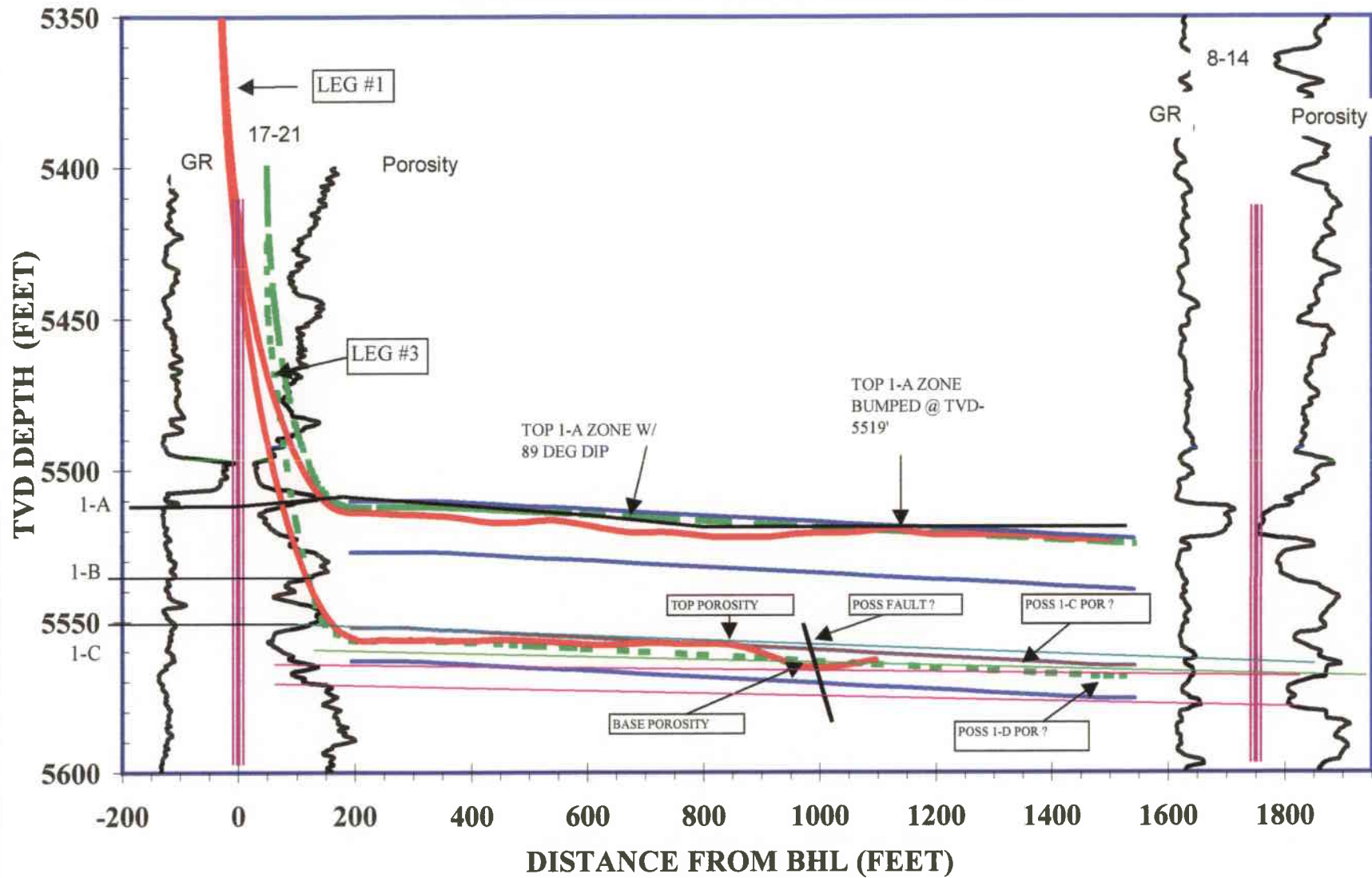
The upper limit of the porosity horizon was encountered at a measured depth of 6200', true vertical depth of 5557' and a horizontal displacement of 716'. This upper limit was defined by an increase in the limestone constituent of the samples with the limestone being similar to the tight limestone packstones seen above the 1-C horizon while drilling the curve section of the hole. The well path was turned down at this point so as to stay in the porosity development. The combination of a down slide and a "bounce" off the top of the porosity resulted in the wellbore taking a decided downward trend with an angle as low as 86.7 degrees being recorded at a measured depth of 6400 feet. The base of the 1-C porosity horizon was encountered at a measured depth of 6440', true vertical depth of 5564' with the well path still oriented in a downward direction indicating the 1-C porosity to be only about 7 feet thick. The lithology of the zone through this interval became slightly more limy but still displayed fair intercrystalline porosity development with fair to good even brown to dark brown staining, even dull to moderate yellow fluorescence, but displayed only slow to moderately fast streaming and a milky diffused cut.

After penetrating the base of the 1-C porosity, the wellpath was oriented upward to attempt to re-acquire the porosity. The interval from 6440' through 6588' measured depth reached a maximum true vertical depth of 5565 feet before coming back up to a true vertical depth of 5562' at 6588'. The lithology of this interval displayed about 50% sucrosic dolomite grainstone, tan to light brown to brown, very fine crystalline to microcrystalline with a grainy to microsucrosic texture and fair to poor intercrystalline porosity. Also through this interval was a dolomitic limestone grading to dolomite, off white to light gray and mottled in nature, microcrystalline to cryptocrystalline and quite anhydritic with a chalky to earthy texture and a platy nature due to bit gouge. Scattered fossils, including crinoids were still present as well as dark gray to black carbonaceous flakes. It appeared the porosity development in the dolomitic grainstone was most likely filled with the light gray anhydritic dolomites. Shows appeared to be spotty at best, but show analysis was difficult due to the abundant oil in the drilling fluids system (from the oil produced while the lateral was being drilled).

With the well path oriented in an upward direction, the 1-C porosity horizon was once more encountered from a measured depth of 6588' to 6650', corresponding to a true vertical depth of 5562' to 5559. The porosity interval was determined primarily from and increase in penetration rate as the lithology appeared to be limestone grading to dolomitic limestone, cream to tan to light brown, microcrystalline to cryptocrystalline with a predominately tight crystalline matrix and inter-bedded dolomite grainstone, tan to brown to gray, grainy to chalky in nature, slightly argillaceous and slightly fossiliferous with common to abundant light gray anhydritic dolomite porosity fill. Porosity was interpreted to be spotty poor intercrystalline in nature with spotty brown stain, spotty dull yellow fluorescence and slow streaming to fair residual ring cuts.

In conclusion, it appears the 1-C porosity horizon thinned abruptly and effectively pinched out toward the end of the lateral with the porosity becoming filled with the light gray anhydritic dolomite facies. After discussion with the Mobil geology department, the lateral was terminated early within the 1-C porosity zone without attempting to transition down into the 1-D horizon. This lateral, however, did open up a considerable amount of effective porosity and permeability to the wellbore within the 1-C porosity horizon from where it was first penetrated at 5858' to a measured depth of 6440'. The interval from 5650' measured depth to 6440' was interpreted to be essentially a virgin reservoir environment and should contribute substantial production potential for this re-entry.

MOBIL, Ratherford Unit #17-21, Northwest Laterals



MOBIL

**RATHERFORD UNIT #17-21
SE HORIZONTAL LATERAL **LEG #2**
1-B POROSITY BENCH
DESERT CREEK MEMBER
PARADOX FORMATION
SECTION 17, T41S, R24E
SAN JUAN, UTAH**

**GEOLOGY REPORT
By
JASON BLAKE – DAVE MEADE
& MARVIN ROANHORSE
ROCKY MOUNTAIN GEO-ENGINEERING CORP.
GRAND JUNCTION, COLORADO
(970) 243-3044**

MICROFICHE

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WELL SUMMARY

OPERATOR: MOBIL EXPLORATION & PRODUCTION U.S. INC.

NAME: RATHERFORD UNIT #17-21 SE HORIZONTAL LATERAL
LEG #2 IN THE DESERT CREEK 1-B POROSITY BENCH

LOCATION: SECTION 17, T41S, R24E

COUNTY/STATE: SAN JUAN, UTAH

ELEVATION: KB:4751' GL:4739'

SPUD DATE: 4/18/98

COMPLETION DATE: 4/23/98

DRILLING ENGINEER: BENNY BRIGGS / SIMON BARRERA

WELLSITE GEOLOGY: JASON BLAKE / MARVIN ROANHORSE / DAVE MEADE

**MUDLOGGING
ENGINEERS:** JASON BLAKE / MARVIN ROANHORSE / DAVE MEADE

CONTRACTOR: BIG "A" RIG 25
TOOLPUSHER: J. DEES

HOLE SIZE: 4 3/4"

CASING RECORD: SIDETRACK IN WINDOW AT 5324' MEASURED DEPTH

DRILLING MUD: M-I DRILLING FLUIDS
ENGINEER: DANNE BEASON
MUD TYPE: FRESH WATER & BRINE WATER W/ POLYMER SWEEPS

**DIRECTIONAL
DRILLING CO:** SPERRY-SUN

ELECTICAL LOGGING: NA

TOTAL DEPTH: 6576' MEASURED DEPTH; TRUE VERTICAL DEPTH-5555.5'

STATUS: TOH & LAY DOWN TOOLS – PREPARE WELL FOR LEG #3

DRILLING CHRONOLOGY
RATHERFORD UNIT #17-21
1-B SE HORIZONTAL LATERAL LEG #2

DATE	DEPTH	DAILY	ACTIVITY
4/18/98	5324'	7'	Pick up whipstock #2 and orient. Kill well with brine. TIH with whipstock and starter mill and set whipstock. Shear off, swivel up, fill pipe and circ out. Mill with starter mill 5324'-5326'. Displace hole with brine and TOH. Lay down starter mill, pick up window mill assembly and TIH. Swivel up, break circ and mill window 5326'-5331'. Circ sweep and displace with brine. TOH and lay down mill assembly. Pick up dir motor assembly, test and TIH.
4/19/98	5331'	170'	Finish TIH with motor assembly. Swivel up, break circ to clean hole. Rig up and run gyro. Time drill @1min/inch 5331-5334. Time drill 2 inch/min 5334'-5336'. Dir drlg and surveys with gyro, 5336'-5359'. Pull and rig down gyro. Dir drlg and surveys 5359'-5501'.
4/20/98	5501'	136'	Dir drlg & surveys 5501'-5637'. Spot brine. TOOH. Change out bit, BHA, & test. TIH
4/21/98	5637'	385'	TIH. Swivel up, break circ. Dir drlg & surveys
4/22/98	6022'	326'	Dir drlg & surveys
4/23/98	6348'	228'	Dir drlg & surveys to 6576', Pump 10 bbl sweep & cir out spls, TOH & lay down lateral assembly, P.U. retrieving hook & TIH, P.U. & strap 24 jts AOH, TIH, Latch & pull old whipstock, Cir btms up & displace with brine
4/24/98	6576'		Displace hole w/brine, TOH, Lay down old whipstock

DAILY ACTIVITY

Operator: MOBIL

Well Name: RATHERFORD UNIT #17-21 SE 1-B HORIZONTAL LATERAL LEG #2

DATE	DEPTH	DAILY	DATE	DEPTH	DAILY
4/18/98	5324'	7'			
4/19/98	5331'	170'			
4/20/98	5501'	136'			
4/21/98	5637'	385'			
4/22/98	6022'	326'			
4/23/98	6348'	228'			
TD	6576'				

BIT RECORD

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #17-21 SE 1-B HORIZONTAL LATERAL LEG #2

RUN	SIZE	MAKE	TYPE	IN/OUT	FTG	HRS	FT/HR
1	4 3/4"	STC	MF-3P	5331'/	306'	35.5	8.62
Bit #3				5637'			
2(RR)	4 3/4"	STC	MF-3P	5637'/	939'	62	15.2
Bit #4				6576'		(122 TOT.)	

MUD REPORT

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #17-21 SE 1-B HORIZONTAL LATERAL LEG #2

DATE	DEPTH	WT	VIS	PLS	YLD	GEL	PH	WL	CK	CHL	CA	SD	OIL	WTR
4/18/98	5333'	8.9	26	1	—	0/0	10.0	NC	NC	54.8K	5960	—	4%	96%
4/19/98	5410'	8.8	26	1	—	0/0	10.5	NC	NC	50.2K	5200	—	4%	96%
4/20/98	5552'	8.9	26	1	—	0/0	10.5	NC	NC	55K	5680	—	2%	98%
4/21/98	5693'	8.8	27	2	1	0/0	11.0	NC	NC	74K	4680	—	8%	92%
4/22/98	6139'	8.7	27	2	1	0/0	11.0	NC	NC	70K	4400	—	8%	92%
4/23/98	6474'	8.6	27	2	1	0/0	11.0	NC	NC	63K	4400	—	5%	95%

SPERRY-SUN DRILLING SERVICES
SURVEY DATA

Customer ... : Mobil (Utah)
Platform ... : RATHERFOED UNIT
Slot/Well ... : BA2 5/17-21, 2A1

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	TVD	NORTHINGS FEET	EASTINGS FEET	VERTICAL SECTION	DOG LEG
5300	0.19	151.63	5299.8	15.6	S 27.8	E 30.2	0
5324	0.15	286.98	5323.8	15.63	S 27.79	E 30.21	1.31
5331	3	138	5330.8	15.76	S 27.9	E 30.38	44.71
5351	8.7	141.6	5350.68	17.34	S 29.2	E 32.42	28.55
5371	15.2	142.3	5370.24	20.6	S 31.74	E 36.55	32.51
5391	22.6	142.6	5389.15	25.73	S 35.68	E 43	37
5411	29.9	144.4	5407.07	32.85	S 40.93	E 51.8	36.71
5431	34.3	146.6	5424.01	41.61	S 46.93	E 62.33	22.76
5451	39.2	147.2	5440.03	51.64	S 53.46	E 74.15	24.57
5471	45.4	146	5454.82	62.86	S 60.88	E 87.45	31.26
5491	48.1	146.3	5468.52	74.96	S 68.99	E 101.87	13.54
5511	52.3	145.2	5481.32	87.66	S 77.64	E 117.09	21.42
5531	56.6	143.7	5492.95	100.89	S 87.1	E 133.26	22.35
5551	59.7	142.8	5503.5	114.5	S 97.27	E 150.17	15.96
5571	64.1	143.5	5512.92	128.61	S 107.84	E 167.74	22.22
5591	68.9	143.7	5520.89	143.37	S 118.72	E 185.99	24.02
5611	72.5	146.6	5527.5	158.86	S 129.5	E 204.71	22.61
5631	76.5	143.9	5532.85	174.69	S 140.49	E 223.82	23.86
5651	81.2	143.9	5536.71	190.54	S 152.05	E 243.34	23.5
5686	90	143.9	5539.4	218.71	S 172.59	E 278.01	25.14
5728	91	142.1	5539.03	252.25	S 197.86	E 319.85	4.9
5759	88.4	139.8	5539.19	276.32	S 217.39	E 350.8	11
5790	88.7	137.9	5539.97	299.65	S 237.78	E 381.79	6.2
5822	88.9	136.5	5540.65	323.12	S 259.52	E 413.78	4.42
5854	91.3	137.2	5540.59	346.47	S 281.4	E 445.77	7.81
5886	88.9	135.8	5540.53	369.68	S 303.42	E 477.76	8.68
5918	88.9	132.1	5541.15	391.88	S 326.45	E 509.66	11.56
5949	92.9	133.1	5540.66	412.86	S 349.27	E 540.52	13.3
5981	91.1	132.4	5539.54	434.56	S 372.75	E 572.36	6.03
6013	89.1	133.1	5539.49	456.28	S 396.25	E 604.22	6.62
6044	88.2	134	5540.22	477.64	S 418.71	E 635.12	4.11
6076	86.9	134.4	5541.59	499.92	S 441.63	E 667.02	4.25
6107	87	133.8	5543.24	521.47	S 463.86	E 697.91	1.96
6139	87.2	134.9	5544.86	543.81	S 486.71	E 729.8	3.49

6171 MEASURED DEPTH	86.6 ANGLE DEG	137 DIRECTION DEG	5546.59 TVD	566.77 NORTHINGS FEET	S	508.93 EASTINGS FEET	E	761.73 VERTICAL DOG SECTION	6.82 DOG LEG
6202	86.7	137.9	5548.4	589.57	S	529.85	E	792.68	2.92
6234	89.7	138.6	5549.4	613.43	S	551.15	E	824.66	9.63
6265	90.5	139.8	5549.35	636.89	S	571.4	E	855.65	4.65
6297	87.2	139.6	5549.99	661.29	S	592.09	E	887.62	10.33
6329	85.8	140.3	5551.94	685.74	S	612.65	E	919.54	4.89
6361	85.3	140.5	5554.43	710.32	S	632.98	E	951.42	1.68
6393	87.1	139.8	5556.55	734.83	S	653.44	E	983.33	6.03
6424	89.8	139.6	5557.39	758.47	S	673.48	E	1014.3	8.73
6455	89.7	139.8	5557.52	782.11	S	693.53	E	1045.28	0.72
6486	89.6	140.3	5557.71	805.87	S	713.44	E	1076.26	1.64
6518	90.3	141.2	5557.74	830.65	S	733.68	E	1108.23	3.56
6544	92.7	141.4	5557.06	850.94	S	749.93	E	1134.17	9.26
6576	92.7	141.4	5555.55	875.92	S	769.88	E	1166.08	0

THE DOGLEG SEVERITY IS IN DEGREES PER 100.00 FEET.
 N/E COORDINATE VALUES GIVEN RELATIVE TO WELL HEAD.
 TVD COORDINATE VALUES GIVEN RELATIVE TO WELL HEAD.
 THE VERTICAL SECTION ORIGIN IS WELL HEAD.
 THE VERTICAL SECTION WAS COMPUTED ALONG 138.00 (TRUE).
 CALCULATION METHOD: MINIMUM CURVATURE.

SAMPLE DESCRIPTIONS

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #17-21 SE 1-B HORIZONTAL LATERAL LEG #2

DEPTH	LITHOLOGY
5331.00 5340.00	"LS,brn-gr brn,occ crm-tn,mic-crypnl,pred dens-sl chky/slty tex ip,mod sft,argil w slty resid,rr micro pyr;no vis POR,STN,FLUOR or CUT"
5340.00 5350.00	"LS aa,brn-gr brn,occ crm-tn,mic-crypnl,pred dens-sl chky/slty tex ip,mod sft,argil/slty ip,rr micro pyr;no vis POR,STN,spty bri FLUOR,no CUT"
5350.00 5360.00	"SLTSTN,tn-brn,sft,calc,scat SH,dk gr-blk,sub tab,calc,LS,lt brn-brn,frm,crypnl,dens,scat xln calc;no vis POR,NFSOC"
5360.00 5370.00	"LS,off wht-tn,mic-crypnl,com chky tex-dens mtrx ip,rr dk gr transl CHT,scat blk SH,sub tab,calc,scat SLTSTN aa;no vis POR,NFSOC"
5370.00 5380.00	"LS,off wht-lt gr mott-tn ip,mic-crypnl,com chky-slty tex- dens tt xln mtrx ip,rr lt gr-wht transl CHT; no vis POR,NFSOC"
5380.00 5390.00	"LS,wht-tn-lt brn,mic-crypnl,dens tt-sft chky/slty ip,sl foss + CALC DOLO,med brn,vfn-mic xln,suc tex,sl anhy,scat brn CHT,scat xln calc;calc dolo w pr intrxln POR,brn STN,even mod yel FLUOR,sl-fr strm CUT"
5390.00 5400.00	"pred LS,wht-lt tn,chky/grny-dens,sl anhy,sl argil,com tn transl CHT;no POR,NFSOC"
5400.00 5420.00	"LS,gr-tn-crm ip,mic-crypnl,dens tt mtrx-sl chky/slty tex,sl sil ip,scat-com gr CHT,sl foss ip;no vis POR,no STN,spty FLUOR,sl cut(cont from oil in system)"
5420.00 5430.00	"LS crm-wh-tan,lt-mgybrn,brn,crpxl,micxl-occ vfxl,chky-occ slty/rr sl sdy strk,tr tan-brn CHT,sl anhy/tr xln ANHY,rr blk SH lam-frag,tt- tr intxl/rr frac POR,tr scat bri-mod bri yel FLOR,rr brn STN,fr slow stmg CUT"
5430.00 5440.00	"LS AA, rr pyr,tt,no-rr intxl POR,FLOR-STN AA,v p dif/v fnt dull res ring CUT"
5440.00 5450.00	"LS AA,bcmg mot/dkbrn-blk strk,chky-sl anhy/rr xln ANHY,tr SH AA,rr CHT AA,POR-FLOR-STN-CUT AA"
5450.00 5460.00	"LS crm-tan-wh,occ lt-mgybrn,tr dkbrngy-brn,crpxl,micxl- vfxl,pred dns/thn chky-rr slty strk,tr tan-brn CHT,sl anhy/rr xln ANHY,rr blk SH lam-frag,tt-tr intxl POR,tr-rr scat bri yel FLOR,no-rr ltbrn STN,p dif/v fnt res ring CUT"
5460.00 5470.00	"LS AA,tt,no-rr intxl POR,FLOR-STN-CUT AA"

DEPTH	LITHOLOGY
5470.00 5480.00	"LS lt-m-dkgybrn,tan-crm,occ ltgy,dkbrn-brngy,micxl-crpxl-tr vfxl,rthy-sl slty,occ v mot,sl shy ip,rr styl,tr dol strk,sl chky-anhy,tt/rr intxl POR,v rr scat bri yel FLOR,no-tr ltbrn STN,CUT AA"
5480.00 5490.00	"LS wh-crm-ltgy,tan-ltbrn,occ brn,ltbrngy,crpxl-micxl,vfxl,pred rthy-sl slty/intbd chky-sl mrly prtgs & rr sdy QTZ/calc mtrx strk,sl anhy/tr xln ANHY,rr CHT AA,tt-tr intxl POR,NFSOC"
5490.00 5500.00	"LS AA,tt,no-rr intxl POR,FLOR-STN-CUT AA"
5500.00 5510.00	"LS tan-crm,ltgy,occ wh,brn,ltbrngy,crpxl-micxl,tr vfxl,pred dns,tt,w/thn intbd mot chky-sl mrly prtgs & tr slty-rr sdy strk/calc mtrx,sl anhy/tr xln ANHY,rr CHT AA & mic fos,tt-tr intxl POR,NFSOC"
5510.00 5520.00	"LS wh-crm-ltgy,tan-ltbrn,occ brn,ltbrngy,crpxl-micxl,vfxl,dns/thn intbd chky-sl mrly prtgs & rthy-slty-rr sdy strk AA,sl anhy/tr xln ANHY,rr CHT AA,tt-tr intxl POR,NFSOC"
5520.00 5540.00	"LS,crm-tn-lt brn,mic-crypnl,sft chky/rthy-sl frm,dens mtx ip,sl argil,scat lt gr-tn CHT,scat SH,dk brn-blk,sub blk-tab ip,calc/dolo,slty,carb,scat anhy incl;pr-no intrxln/rthy POR,no vis STN,vspty dull yel FLUOR,no CUT"
5540.00 5550.00	"pred SH,dk brn-blk,sub blk-tab ip,calc/dolo,slty,carb,scat anhy incl,scat LS,crm-tn-lt brn aa;no vis POR,NFSOC"
5550.00 5560.00	"SH aa,dk brn-blk,sub blk-tab ip,carb,calc + LS,tn-lt brn,occ crm & lt gr,mic-crypnl,pred dens xln mtrx-slty,argil ip,sl pyr ip;vpr-no POR,no vis STN,FLUOR or CUT"
5560.00 5570.00	"SH,dk brn-blk aa & LS aa,tn-brn,occ gr;no vis POR,STN,FLUOR or CUT"
5570.00 5580.00	"LS,crm-tn-lt brn,vfn-mic xln,dens-sub suc,oolitic,sl anhy,GRNSTN & intrbd PCKSTN;fr-gd oomold POR,dk brn-spty blk STN,mod yel-gld FLUOR,fr strm-diff CUT"
5580.00 5600.00	"LS,off wht-crm-tn,mic-crypnl,dens xln mtrx-chky tex,anhy;pr intrxln POR,scat dk brn-blk STN,spty mod yel FLUOR,sl strm CUT + scat LS aa,tn-brn,vfn-mic xln,ool;fr oomold POR,brn-dk brn STN,fr FLUOR & CUT aa"
5600.00 5610.00	"LS tan-ltbrn,vfn-mic,xln-gran mtrx ip,ool GRNST,sl anhy/tr PCKST,off wht-crm,mic-crpxl,dns-sl chky tex;fr oomold-intxl-minor oocast POR,fr brn-dk brn STN,fr mod yel-gld FLOR,fr stm-dif CUT"
5610.00 5630.00	"LS tan-ltbrn,crm-wh,occ mbrn,ltgybrn,crpxl,gran-vfxl,chky-arg dns-thn plty PCKST intbd/ool-oom GRNST,sl anhy/rr xln ANHY,sl dol/rr DOL cmt,vrr ltgy-trnsl-wh sil-CHT frag,fr intxl/scat ool POR,g scat mod bri-bri yel FLOR,fr ltrbrn/tr brn-pp blk STN,CUT AA"

DEPTH	LITHOLOGY
5630.00 5637.00	"LS AA,pred PCKST AA/rr GRNST frag,tt-tr intxl POR,tr scat mod bri-bri yel FLOR,fr-g ltbrn/tr brn,p dif/v fnt res ring CUT"
5637.00 5650.00	"LS tan-crm-off wh,occ ltbrn-rr brn,crpxl,micxl-vfxl,thn chky plty-dns sl arg PCKST intbd/tr rthy-mot GRNST,anhy/tr xln ANHY,sl dol,tr mic fos,v rr tan sil-CHT frag,tt-tr intxl POR,fr scat mod bri-bri yel FLOR,fr lt brn/tr brn-pp blk STN,fr slow stmg CUT"
5650.00 5660.00	"LS AA,pred PCKST AA,tr sl gran mot-mic fos GRNST/chky-sl anhy POR fl,POR AA,incr FLOR AA,fr ltbrn/tr brn-rr blk STN,fr-g slow-mod fast stmg mlky CUT"
5660.00 5670.00	"LS tan-ltbrn,occ crm-wh,AA,pred v sl ool dns chky-plty PKST,w/v rr stks ooc GRNST,rr-tr thn stks intxl POR,tr dull yel FLOR,rr ltbrn STN-v rr spty blk dd o STN,v rr slow stmg-slow dif CUT"
5670.00 5690.00	"LS tan-ltbrn,crm-wh ip,crpxl-micxl,rr vfxl-gran,pred dns tt sl ool occ chk-plty PKST,w/v rr v thn stks sl ool GRNST,v sl anhy,rr CHT frag,tt-v rr POR-FLOR-STN-CUT AA"
5690.00 5700.00	"LS pred PKST AA,incr sl ool GRNST,v sl anhy-v rr ANHY xl,v rr bf-ltbrn CHT frag,ttmfr intxl-v rr ool POR,tr dull-bri yel FLOR,rr spty brn-blk STN,tr-mfr slow dif-mod fast stmg CUT"
5700.00 5720.00	"LS tan-ltbrn,occ crm,rr wh,crpxl-vfxl,dns,occ gran stks,intbd dns occ chk-plty sl fos occ anhy PKST & v sl ool GRNST,v rr ANHY xl & trns-lbf CHT frag,tt-mfr intxl-v rr ool POR,tr-fr dull-bri yel FLOR,rr-tr spty ltbrn-v rr blk STN,tr slow-mod faststmg CUT"
5720.00 5730.00	"LS tan-ltbrn,occ crm-rr wh,crpxl-vfxl,occ gran-micsuc,incr sl ooc-oom GRNST w/decr intbd sl plty-chk v sl ool occ anhy PKST,v rr bf-trns-lbf CHT frag,POR-FLOR-STN-CUT AA"
5730.00 5740.00	"LS AA,bcmg pred v sl ooc-oom GRNST,w/scat stks dns occ chk-plty sl ool tt PKST,tt-fr intxl-tr ool POR,fr dull-bri yel FLOR,tr ltbrn STN-v rr blk dd o STN,fr-g slow-mod fast stmg CUT"
5740.00 5750.00	"LS tan-ltbrn,occ crm-wh,micxl-vfxl,occ crpxl,gran-micsuc ip,pred sl ooc-oom GRNST,w/thn PKST AA,tt-mg intxl-rr ool POR,fr-g FLOR AA,STN-CUT AA"
5750.00 5770.00	"LS tan-brn,occ crm-tan,rr wh,crpxl-vfxl,occ gran-micsuc,pred sl ooc-oom GRNST w/tr sl plty-chk v sl ool dns anhy PKST,v rr bf-trns-lbf CHT frag,scat ANHY xl-rr POR fl,tt ip,mfr-g intxl-sl ool POR,fr-mg dull-bri FLOR,fr brn-tr blk STN,fr-g slow-mod fast CUT"
5770.00 5790.00	"LS crm-tan,occ ltbrn,wh ip,AA,incr & bcmg pred dns sl chk-plty anhy v sl chty PKST w/thn intbd sl ooc-oom GRNST,scat trns-lbf CHT frag,rr ANHY xl-POR fl,decr POR-FLOR-STN-CUT"

DEPTH	LITHOLOGY
5790.00 5800.00	"LS tan-ltbrn,occ crm-wh,micxl-vfxl,occ crpxl,gran-micsuc ip,pred sl ool-oom GRNST,w/thn PKST AA,tt-mg intxl-rr ool POR,fr-g FLOR AA,incr STN-CUT AA"
5800.00 5810.00	"LS crm-tan,occ ltbrn,wh ip,AA,incr & bcmg pred dns sl chk-plty anhy v sl chty PKST w/thn intbd sl ool-oom GRNST,scat trnsf-bf CHT frag,rr ANHY xl-POR fl,decr POR-FLOR-STN-CUT"
5810.00 5820.00	"LS crm-tan-ltbrn,wh ip,crpxl-vfxl,pred dns tt sl chk-plty v sl mic fos PKST w/incr sl gran-micsuc v sl ool GRNST,fr intxl POR,fr FLOR-STN-CUT AA"
5820.00 5830.00	"LS tan-crm-wh,ltbrn ip,crpxl-vfxl,pred dns tt sl chk-plty v sl mic fos PKST w/incr sl gran-micsuc v sl ool GRNST,fr intxl POR,fr FLOR-STN-CUT AA"
5830.00 5840.00	"LS AA,vfxl-gran-micxl,occ crpxl,pred GRNST AA/decr PCKST AA,g-fr ool-intxl POR,g scat bri yel FLOR,fr ltbrn/tr blk pp STN,g dif/tr mod fast stmg CUT"
5840.00 5850.00	"LS AA,pred chky sl ool GRNST w/tr dns-thn plty PCKST,g-fr ool-intxl POR,FLOR-STN-CUT AA"
5850.00 5860.00	"LS tan-ltbrn,occ crm-wh,mbrn,gran-vfxl,micxl-tr crpxl,pred ool-oom GRNST intbd/thn chky plty-dns v sl ool PKST,g-fr ool-intxl POR,g even bri-mod bri yel FLOR,g ltbrn/tr brn/rr blk STN,g fast stmg mlky CUT"
5860.00 5870.00	"LS AA,ool-oom GRNST/rr PKST AA,g ool-tr intxl POR,g even bri-mod bri yel FLOR,g ltbrn-brn/tr blk dd o STN,g fast stmg mlky CUT"
5870.00 5880.00	"LS AA,ool-oom GRNST/tr thn chky plty-rr sl ool dns PCKST,sl anhy/rr xln ANHY,v sl dol,g ool/tr intxl POR,FLOR-STN AA,g fast stmg mlky CUT"
5880.00 5890.00	"LS lt-mbrn-tan,tr crm-wh,gran-micsuc,vfxl-suc,ool-oom GRNST/tr PCKST AA,POR-FLOR AA,g brn-ltbrn/tr dkbrn-blk dd o STN,g fast stmg mlky CUT"
5890.00 5900.00	"LS AA,ool-oom GRNST/tr PCKST AA,POR-FLOR AA,g brn-ltbrn/tr dkbrn-blk dd o STN,g fast stmg mlky CUT"
5900.00 5920.00	"LS ltgybrn-crm-tan,ltbrn,occ brn,gran-vfxl-micsuc,micxl-occ crpxl,pred sl ool-oom chky GRNST intbd/sl incr PKST AA,anhy/tr xln ANHY,g-fr ool-intxl POR/tr POR fl,g even mod bri-dull yel FLOR,g ltbrn/tr brn-rr blk STN,fr mod fast-slow stmg mlky CUT"
5920.00 5940.00	"LS AA,gran-vfxl-micsuc,micxl-occ crpxl,pred ool-oom GRNST intbd/thn chky plty-dns sl ool PKST,sl anhy/rr xln ANHY-POR fl,sl dol/tr DOL cmt,g ool POR,g even mod bri-bri yel FLOR,g ltbrn-brn/tr blk dd o STN,g fast-mod fast stmg mlky CUT"

DEPTH	LITHOLOGY
5940.00	5960.00 "LS ltbrn-tan,mbrn,occ crm,tr dkbrn,wh,gran-vfxl,micsuc,occ suc-tr crpxl,ool-oom GRNST,tr dns sl ool-plty chky PKST,chky-sl anhy/tr POR fl-rr xln ANHY,sl dol,g ool-tr POR fl,g even bri yel FLOR,g brn-ltbrn/tr dkbrn-blk STN,g fast stmg mlky CUT"
5960.00	5990.00 "LS tan-ltbrn,occ brn,crm,tr wh,gran-vfxl,micsuc-sl suc,tr crpxl,ool-oom GRNST/tr dns sl ool-thn plty PKST,chky-sl anhy/tr POR fl-rr xln ANHY,v sl dol,POR-FLOR AA,fr-g ltbrn/scat brn-tr blk dd o STN,g mod fast/tr fast stmg mlky CUT"
5990.00	6010.00 "LS ltbrn-tan,ltgybrn-crm,occ m-dkbrn,tr wh,gran-micsuc-vfxl,sl suc,tr crpxl,bcmg dns tt sl ool GRNST,rr dns-thn plty PKST,sl chky-anhy/tr POR fl-xln ANHY,v rr trns-l-crm CHT,v sl dol,tt-fr intxl-sl ool POR,FLOR AA,g brn-ltbrn/tr dk brn-blk dd o STN,g fast stmg mlky-sl blooming mlky CUT"
6010.00	6030.00 "LS tan-ltbrn,incr crm-wh,occ mbrn,ltgybrn,vfxl-gran-micsuc,micxl-sl suc,tr crpxl,pred GRNST AA/incr thn chky plty-tr dns sl gran-ool PKST,sl anhy/rr xln ANHY-POR fl,v rr trns-l CHT,tr v sl dol strk,fr-g intxl-sl ool POR,g even mod bri-bri yel FLOR,fr-g ltbrn/scat brn & rr dkbrn-blk pp dd o STN,g mod fast-slow stmg mlky CUT"
6030.00	6049.00 "LS AA,pred dns-sl ool GRNST,tr scat dns sl ool-thn chky plty PKST,sl anhy/tr xln ANHY-POR fl,rr CHT AA,g-fr intxl/sl ool POR,g even mod bri-bri yel FLOR,g ltbrn-brn/tr dkbrn-rr blk pp dd o STN,g fast stmg mlky CUT"
6050.00	6070.00 "LS tan-crm,ltbrn,occ brn,wh,vfxl-micxl,crpxl,occ gran,pred chky dns-thn plty PKST,tr scat-intbd sl ool GRNST,sl anhy/tr POR fl-xln ANHY,rr trns-l-wh CHT,tt-tr intxl-rr ool POR,fr-g scat mod bri-dull yel FLOR,fr ltbrn/tr brn-rr blk STN tr dif/v fnt res ring CUT"
6070.00	6090.00 "LS AA,pred chky dns-thn plty PKST,tr dns sl ool GRNST frag,sl anhy/tr xln ANHY-POR fl,tr crm-trns-l CHT incl,tr mic fos-rr OST,occ sl agal,tt-tr intxl POR,g-fr scat mod bri-bri yel FLOR,fr-g ltbrn/rr brn-blk pp dd o STN,fr dif/v fnt res ring CUT "
6090.00	6110.00 "LS tan-crm-wh,occ ltbrn-brn,crpxl-micxl,vfxl ip,tr gran,pred chky dns-thn plty sl fos PKST,tr thn intbd sl ool GRNST,anhy ip/rr ANHY fl POR,rr trns-l-bf CHT,tt-tr intxl-v rr ool POR,mfr mod bri-dull yel FLOR,rr-tr ltbrn-brn-rr blk STN,tr slow dif-stmg CUT"
6110.00	6120.00 "LS AA,sl incr brn,pred dns PKST w/sl incr v sl ooc-oom GRNST,scat CHT frag,scat ANHY xl-incl,tt-tr intxl-v rr ool POR,mfr dull-bri yel FLOR,rr-tr ltbrn-brn STN-v rr spty blk dd o STN,tr-mfr slow dif-tr slow-mod fast stmg CUT"

DEPTH	LITHOLOGY
6120.00 6150.00	"LS crm-wh,tan,rr ltbrn-brn,crpxl -micxl,tr vfxl-gran stks,pred dns sl fos occ chk-plty PKST,thn stks v sl ool GRNST,wh-bf CHT frag,sl anhy-rr ANHY xl,v sl dol,v rr styl,tt-rr intxl POR,tr dull-bri yel FLOR,rr spty brn STN-spty blk dd o STN,rr slow dif CUT"
6150.00 6170.00	"LS AA pred dns tt chty v sl chk-occ plty v sl fos PKST w/thn stks sl ool GRNST,rr-tr ANHY-DOL cmt,incr trns-l-wh-bf CHT frag,tt-scat stks intxl POR,tr dull-bri yel FLOR,rr-tr spty brn STN-v rr spty blk dd o STN,rr-mfr slow dif-rr slow-mod fast stmg CUT"
6170.00 6190.00	"LS AA,pred PKST AA,decr thn scat GRAN STKS,decr POR-FLOR-STN-CUT"
6190.00 6210.00	"LS crm-wh,tan,rr ltbrn-brn,crpxl-micxl,tr vfxl-gran stks,pred dns sl fos chk-plty ip PKST,rr stks sl ool GRNST,wh-bf CHT frag,sl anhy,rr ANHY-DOL cmt,v rr styl,tt-rr intxl POR,mfr dull-bri yel FLOR,rr ltbrn-brn-v rr blk dd o STN,rr slow dif-slow stmg CUT"
6210.00 6230.00	"LS AA,pred PKST AA,decr thn scat sl ool GRAN stks,scat frac w/ANHY-CALC fl,decr POR-FLOR-STN-CUT AA"
6230.00 6250.00	"LS crm-wh-tan,rr ltbrn-brn,crpxl-micxl,rr vfxl-gran stks,pred dns sl fos chk-plty ip PKST,rr sl ool GRNST stks,wh-bf CHT frag,sl anhy,rr ANHY-DOL cmt,v rr styl,tt-rr intxl POR,tr dull yel FLOR,rr ltbrn-brn-v rr blk dd o STN,rr slow dif-rr slow stmg CUT"
6250.00 6270.00	"LS AA,crpxl-micxl,rr vfxl-gran stks,pred dns sl fos chk-plty PKST,rr sl ool GRNST stks,wh-trns-l-occ bf CHT frag,sl anhy/tr xln ANHY-POR fl,rr DOL cmt,tt-rr intxl POR,no-rr dull yel FLOR,rr ltbrn-brn STN,rr slow dif/v fnt res ring CUT"
6270.00 6290.00	"LS AA,pred dns v sl fos chk-plty PKST,rr sl ool GRNST stks,wh-trns-l-bf CHT frag,sl anhy/tr xln ANHY-POR fl,tt-rr intxl POR,tr scat dull-rr mod bri yel FLOR,rr ltbrn-brn STN,rr-fr slow dif/v fnt res ring-rr slow stmg CUT"
6290.00 6310.00	"LS tan-crm-ltbrn,occ wh,tr brn-rr dkbrn,crpxl-micxl,rr vfxl-sl gran,dns-thn chky plty PKST,v rr sl ool GRNST frag,sl anhy/tr xln ANHY-POR fl,tan-trns-l-wh sl ool CHT,tr blk-dkbrnblk styl-lam-frag,POR-FLOR-STN-STN CUT AA "
6310.00 6330.00	"LS AA,crpxl-micxl,tr gran-sl micsuc,pred PKST AA/tr v sl ool GRNST strk,anhy/tr xln ANHY-POR fl,tr CHT AA,occ sl dol,tt-tr intxl-v rr ool POR,tr scat dull-mod bri yel FLOR,rr ltbrn-tr brn-rr pp blk dd o STN,p dif/v fnt res ring CUT"
6330.00 6350.00	"LS tan-crm-wh,occ ltgybrn,ltbrn,tr brn,micxl-vfxl-crpxl,occ micsuc-sl gran,pred dns-thn chky plty PKST intbd/incr sl ool GRNST,anhy/tr xln ANHY-POR fl,tr CHT AA,v sl dol,fr-g intxl-sl ool POR,g even mod bri-bri yel FLOR,rr ltbrn-tr brn STN,g dif/g fnt res ring & sl tr slow stmg mlky CUT"

DEPTH	LITHOLOGY
6350.00 6370.00	"LS tan-crm,occ ltbrn,tr brn,wh,micxl-vfxl,crpxl,occ micsuc-gran,incr sl ool GRNST,dns-decr thn chky plty PKST,anhy/tr xln ANHY-POR fl,tr CHT AA,fr-g sl ool-intxl POR,g mod bri-dull yel FLOR,fr ltbrn-tr brn-rr pp blk dd o STN,fr-g slow stmg mlky CUT"
6370.00 6390.00 6369.42 0	"LS ltbrn,tan,tr wh-crm,vfxl-gran-micsuc,tr micxl-crpxl,pred sl ool GRNST intbd/chky dns sl ool-thn plty PKST strks,sl anhy/tr scat xln ANHY-rr POR fl,tr wh-trnsl CHT,v sl dol/tr DOL rich cmt ip,g ool-intxl POR,g even mod bri-dull yel FLOR,g-fr ltbrn-brn STN,g fast stmg mlky CUT"
6390.00 6410.00	"LS AA/sl incr wh-crm,vfxl-gran-micsuc,occ crpxl,tr micxl,pred ool GRNST intbd/chky dns sl ool-incr thn plty PKST,sl anhy/tr scat xln ANHY-tr POR fl,tr CHT AA,sl dol/tr DOL rich cmt ip,POR-FLOR AA,g-fr ltbrn-tr brn STN,g mod fast-slow stmg mlky CUT"
6410.00 6420.00	"LS tan-ltbrn,occ brn,rr wh-crm ip,micxl-vfxl,occ crpxl,gran-micsuc ip,pred v sl ool GRNST,scat tt sl ool PKST frag AA,scat CHT frag,fr-g intxl-tr ool POR,fr-g FLOR-STN-CUT AA"
6420.00 6450.00	"LS ltbrn-tan,tr wh-crm-brn,micxl-vfxl,tr crpxl,gran-micsuc ip,pred sl ool GRNST w/chk-v sl plty dns sl ool PKST strks,sl anhy-dol,rr ANHY xl-rr POR fl,rr trnsl-bf CHT frag,sl DOL cmt,g intxl-tr ool POR,g mod bri yel FLOR,fr ltbrn-v rr blk STN,fr fast STN"
6450.00 6470.00	"LS pred GRNST AA,incr clr-trnsl-bf CHT frag,scat ANHY-tr DOL cmt,tt-mg intxl-rr ool POR,mg bri-tr dull yel FLOR,fr ltbrn-rr brn STN-v rr spty blk dd o STN,fr slow-mod fast stmg-tr fast stmg CUT"
6470.00 6490.00	"LS AA,sl incr dns PKST,scat CHT frag,fr-mg intxl-v rr ool POR,g bri-tr dull yel FLOR,fr ltbrn-tr brn-v rr spty blk STN,fr-g mod fast-tr slow stmg CUT"
6490.00 6510.00	"LS tan-ltbrn,crm,rr wh-brn,micxl-vfxl,rr crpxl,gran-micsuc ip,pred v sl ooc-oom GRNST,w/scat dns plty-chk v sl fos PKST incl,sl anhy-dol,scat CHT frag,fr-mg intxl-v rr ool POR,mg bri-rr dull FLOR,mfr-fr ltbrn-rr brn STN-v rr blk dd o STN,mg mod fast CUT"
6510.00 6530.00	"LS tan-crm-wh,ltbrn,occ m-dkbrn,crpxl-vfxl,tr gran-micsuc,incr & bcmg pred dns-sl ooc chk-plty rr ool-mic fos PKST w/decr amnts sl ool GRNST,tr ANHY xl-POR fl,sl dol,scat trnsl-bf CHT frag,tt-mfr intxl-v rr ool POR,mfr bri-dull yel FLOR,fr brn-dkbrn STN-v rr blk dd o STN,fr-mfr slow stmg-slow dif CUT"
6530.00 6550.00	"LS pred tan-ltbrn,occ crm-wh,rr brn,AA,pred intbd PKST & GRNST AA,w/scat CHT frag AA,fr-mfr intxl-v rr scat ool POR,mfr-fr dull-bri yel FLOR,mfr ltbrn-v rr spty brn-blk STN,mfr slow-tr mod fast stmg CUT"

DEPTH	LITHOLOGY
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6550.00 6560.00 "LS AA,decr GRNST,incr CHT frag,sl incr ANHY cmt,decr POR-
FLOR-STN-CUT AA"

6560.00 6576.00 "LS tan,occ crm-ltbrn,rr wh-brn,crpxl-micxl,occ vfxl-
gran,rr micsuc,pred dns tt sl anhy v rr mic fos occ chk-plty PKST,scat thn
intbd v sl ool GRNST,scat CHT frag,v sl DOL cmt,tt-tr intxl-v rr ool POR,mfr
dull-tr bri yel FLOR,spty brn-v rr spty blk STN,tr slow stmg-fr dif-v rr mod
fast stmg CUT"

FORMATION TOPS

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #17-21 SE 1-B HORIZONTAL LATERAL LEG #2

FORMATION NAME		SAMPLE MEASURED DEPTH	SAMPLE TRUE VERTICAL DEPTH	DATUM KB:4751'
UPPER ISMAY		5360'	5355'	-604
LOWER ISMAY		5430'	5423'	-672
GOTHIC SHALE		5532'	5493'	-742
DESERT CREEK		5557'	5506'	-755
DC 1-A ZONE		5562'	5508'	-757
1-A/1-B TRANSITION ZONE		5582'	5516'	-766
DC 1-B ZONE		5846'	5541'	-790

GEOLOGICAL SUMMARY

AND

ZONES OF INTEREST

The Mobil Exploration and Production U.S., Inc., Ratherford Unit #17-21 Southeast Horizontal Lateral Leg #2 was a re-entry of the Mobil Ratherford Unit #17-21 located in Section 17, T41S, R24E, and was sidetracked in a southeasterly direction from a 5331' measured depth, 5331' true vertical depth, on April 19, 1998. The lateral reached a measured depth of 6576', true vertical depth of 5555.5' at total depth, with a horizontal displacement of 1166' and true vertical plane 141.4 degrees on April 23, 1998 in the Desert Creek 1-B porosity zone. During the initial preparation of the well bore, due to bad casing, difficulty was experienced setting the oriented packer. The packer was finally set at 5349' instead of 5456' as originally planned. This necessitated setting the whipstock for lateral #2 about 100 feet higher than called for in the drilling plan, resulting in a curve radius of 208 feet.

During the curve section of the hole, a bit trip was made at a measured depth of 5637', 5534' true vertical depth. The curve was landed at a true vertical depth of 5539.4', in the upper 1-B zone (in the 1-A to 1-B transition zone) of the Desert Creek on April 21, 1998. Because the lateral was started higher than anticipated, the curve section of the hole was begun in the lower portion of the Honaker Trail Formation of the Hermosa Group before encountering the typical section of Upper Ismay, Lower Ismay, Gothic Shale and Desert Creek members of the Upper Paradox Formation.

Objectives of the Ratherford Unit #17-21 leg #2 horizontal lateral were to penetrate and drill the 1-B porosity horizon, to identify and define the lithology, and evaluate the porosity and effective permeability of the 1-B bench of the Desert Creek. These objectives were accomplished in the 1-B zone, although the 1-B zone had very inconsistent lithology with only minor sections having good shows being penetrated. After completing the curve section of the lateral, the lateral section required significant amounts of sliding to try to maintain and change vertical depth as well as horizontal plane direction. The well path essentially used the proposed target line throughout the 1-B zone. Both the top and bottom of the thin porosity were encountered with in the 1-B zone. Near the end of the lateral, it appeared that the lateral was TD'd in the tight dense packstone at the base of the 1-B zone. The lateral section of the hole was terminated 434 feet prematurely due to the lack of porosity encountered and the amount of dense packstones and as well as the amount of anhydrite porosity plugging in the 1-B zone through out the 1-B zone.

The basal 20 feet of the Honaker Trail Limestone was penetrated when drilling was begun just under the whipstock. The lithology was argillaceous limestone, light brown to light gray brown to cream, microcrystalline to cryptocrystalline with an earthy to slightly chalky texture. Interbedded with the limestones were light brown-gray siltstones, soft and calcareous. The zone exhibited very poor to no porosity, no visible staining or cut, but did show scattered bright yellow fluorescence which was most likely either mineral fluorescence or pipe dope contamination. The basal shale marker at the base of the Honaker Trail lime and above Upper Ismay was represented by scattered dark gray to black shale, slightly firm and calcareous with a brown to gray streak.

The top of the Upper Ismay was encountered at a measured depth of 5360', true vertical depth of 5359'. The majority of the formation, from 5360' to 5420' measured depth was characterized by interbedded limestone and argillaceous limestone. The limestone was tan to cream to off white and occasionally brown, microcrystalline to cryptocrystalline with a common chalky to slightly silty texture grading to a dense tight crystalline matrix. Common light tan to brown and occasional dark brown cherts were present plus scattered crystalline calcite and anhydrite. The argillaceous limestones were generally darker in color with a more silty texture, very fine crystalline to microcrystalline, grading to a calcareous siltstone in part. Of interest in this interval was the calcareous dolomite seen from a measured depth of 5379' through 5383' which was medium brown, very fine crystalline to microcrystalline with a sucrosic texture and displaying scattered brown chert, scattered crystalline calcite and anhydrite. This thin interval of dolomite within the Upper Ismay displayed a poor to fair show with poor intercrystalline porosity development, brown stain, even moderate yellow fluorescence and a slow to fair streaming cut. This interval had very poor earthy to no visible intercrystalline porosity, no stain and displayed no fluorescence or cuts. The rest of the interval from 5360' to 5420' had very poor to no porosity development with very slight to no shows. The remainder of the Upper Ismay from 5420' to the top of the Lower Ismay was a limestone, cream to white to tan and occasionally light gray brown, cryptocrystalline to microcrystalline with a chalky to silty texture with rare sandy streaks. The zone was also slightly anhydritic with a trace of crystalline anhydrite, a scattered tan to brown chert and scattered black shale laminae. This zone displayed slight intercrystalline to fracture type porosity development with scattered bright to moderate yellow fluorescence, rare brown stain and a fair slow streaming cut. The Hovenweep marker between the Upper and Lower Ismay members was not represented in the samples in this lateral, most likely as it "fell between" two of the sample intervals.

The top of the Lower Ismay was picked at a measured depth of 5430', 5423' true vertical depth, based primarily on sample identification and an increase in penetration rate. The lithology of the Lower Ismay from 5430' to 5470' measured depth was predominately limestone, white to cream to brown and occasionally light gray brown in color, very fine crystalline to microcrystalline to cryptocrystalline in part, predominately dense and argillaceous with thin chalky to silty streaks. This interval had common tan to brown chert, was slightly anhydritic and had scattered black carbonaceous inclusions. The interval displayed very poorly developed intercrystalline to earthy type porosity in part with only trace shows at best. The lower portion of the Lower Ismay from 5470' to the top of the Gothic at 5632' measured depth became more argillaceous and darker in color. This portion of the section was predominately varicolored mottled limestones, brown to light brown to tan to cream and occasionally off white to white. The texture was mainly microcrystalline to cryptocrystalline, earthy to slightly silty with interbedded chalky to slightly marly partings and was slightly anhydritic with scattered crystalline anhydrite and scattered tan to brown chert. Thin interbeds of calcareous sandstone were observed near the base of the section. Minor traces of fossils of indeterminate character were also present. Only traces of intercrystalline porosity were observed with no visible staining, minor very spotty dull yellow fluorescence and essentially no cuts.

The Gothic Shale was penetrated at a measured depth of 5532', 5493' true vertical depth, and was the typical lithology; predominantly dark brown to black to dark gray black shale, carbonaceous, silty, soft to slightly firm, subblocky to slightly tabular, calcareous to slightly dolomitic and slightly micaceous, with scattered micro pyrite. The top of the Gothic was picked primarily by an increase in penetration rate. The top was represented by only a minor amount of shale in the samples.

The top of the Desert Creek member of the Upper Paradox formation was marked by a thin transition zone facies between the overlying Gothic Shale and the underlying 1-A porosity zone. This thin interval in this lateral was the typical transition zone facies, being in interbeds of light gray microcrystalline limestone, which were argillaceous with a grainy to silty texture and tan to brown limestone, microcrystalline to cryptocrystalline with a dense matrix. This zone displayed no to a

very poorly developed intercrystalline porosity with no visible staining, spotty very poor dull mineral fluorescence and no visible cut.

The top of the Desert Creek 1-A porosity zone was encountered at a measured depth of 5562', true vertical depth of 5509', approximately 2' high to the top of the 1-A zone on the R.U. 17-21 vertical well log. The top was noted by a significant increase in the penetration rate and a change to the typical oolitic limestone grainstone displaying oomoldic and intercrystalline porosity development. The limestone was tan to brown, some cream in color, very fine crystalline to microcrystalline, oolitic and slightly anhydritic with fair to good oomoldic and intercrystalline porosity development, fair brown stain, moderate yellow gold fluorescence and fair streaming to diffuse cuts. Thin interbeds of limestone packstones were present though the 1-A porosity zone and were cream to tan in color, microcrystalline with a dense tight to slightly chalky texture. The packstones displayed only minor shows at best. The 1-A porosity zone was about 8 feet thick in this southeasterly lateral and appeared to thin rapidly away from the vertical well bore. This zone, at a horizontal displacement of 160', is significantly thinner than the 6 foot thick porosity zone seen on the gamma neutron log from the vertical well.

A tight limestone packstone was penetrated from the base of the 1-A porosity zone at 5582' measured depth (5516' TVD) through the top of the 1-B horizon at 5642' measured depth, and continued to the top of the 1-B porosity zone at a measured depth of 5845'. This 1-A to 1-B transition zone interval was characterized by a tight limestone packstone, cream to tan in color, microcrystalline to cryptocrystalline with a dense to slightly chalky micritic matrix and was slightly anhydritic. Very minor fossil fragments, scattered well cemented oolites and traces chert of chert fragments were observed in this section. Only poor spotty intercrystalline to minor oolitic porosity development was noted in this packstone interval with spotty dark brown to black stain, spotty dull yellow gold fluorescence and slow streaming to residual ring cuts. The lateral was leveled at 90 degrees and the curve section of the southeast lateral was completed at a measured 5686', 5539.4' true vertical depth, 4' below the proposed target line, in this tight transition zone.

As the well path was continued slowly downward, after being leveled in the transition zone, the top of the 1-B porosity horizon was penetrated at a measured depth of 5846', true vertical depth of 5540.7', with a horizontal displacement of 438'. As the lateral was continued very slowly downward, the base of the thin porosity streak was bumped at a measured depth of 5628', 5541.5' true vertical depth. The best porosity lithology of the 1-B porosity zone was a tan to light brown, very fine crystalline to microcrystalline, oolitic to oomoldic limestone grainstone, with a microsugrosic to granular texture, and slight anhydritic to dolomitic cement, some scattered anhydrite crystals to inclusions, with fair to good interoolitic to intercrystalline porosity. Scattered streaks of thin, dense, very tight limestone packstones were noted. The samples were fair to good with light brown to brown stain, some scattered black bitchimum stain*, even dull to moderate yellow fold fluorescence and fair to good streaming to bloom cuts. This streak of porosity correlates to the highest 2 feet porosity of the well log for the vertical well. The porosity development on the vertical well log also appears to be about 10' to 11' thick. This porosity streak was only about 1.5 foot thick and had an upward dip of 91.3 degree prior to pinching out.

The well path was oriented downward at a measured depth of 5996', 5539.3' true vertical depth, with a horizontal displacement of 588', to try to reacquire the porosity. At the measured depth of 5996', the lithology became predominately a very tight dense limestone packstone with very thin streaks of slightly oolitic to oomoldic grainstone, cream to tan to brown and occasionally medium brown in color, microcrystalline to cryptocrystalline, with streaks of microsugrosic to granular texture and was slightly fossiliferous and occasionally anhydritic with scattered chert fragments. Porosity development through this interval was generally poor and very streaky, predominately minor intercrystalline to very slightly oolitic with rapidly decreasing visible staining, yellow fluorescence and cuts. This lithology was consistent and became increasingly dense and tight, as the well path was continued downward, until reaching the measured depth of 6334', 5552' true vertical depth, with a horizontal displacement of 925'.

At 6334' the limestones became increasingly granular and oolitic. The penetration rate increased slowly, with the best porosity and penetration rate occurring at a measured depth of 6357', 5553.5' true vertical depth, and a horizontal displacement of 947'. The lithology became predominately a light brown to tan, with decreasing amounts of white to cream, cryptocrystalline to very fine crystalline with increasing amounts of microsucrosic to granular texture. The slightly oolitic to very slightly oomoldic limestone grainstones, had scattered tan to translucent chert fragments and scattered anhydritic to very slightly dolomitic cement, with moderately fair sample shows. Also noted were varying amounts of dense, tan to cream, some white, cryptocrystalline, occasionally platy, very slightly oolitic limestone packstones, and scattered traces of anhydrite crystals and porosity filling in the grainstones. This lithology was consistent to a measured depth of 6443', true vertical depth of 5557.5', and a horizontal displacement of 1034'. At this point in the lateral the well path had been dropped to 10' below the proposed target line in an attempt to find the best porosity in the 1-B zone.

From the measured depth of 6443' the lithology of the zone became increasingly dense, and graded to predominately a very dense limestone packstone. As the lateral was continued, the well path was turned slowly upward in an attempt to regain the thin streak of porosity noted from the true vertical depths of 5553.5' down to 5557'. The limestone packstones increased and became the dominate lithology as the well path climbed upward to a measured depth of 6579', 5555.5' true vertical depth and a horizontal displacement of 1166', at which time the lateral was terminated. Through out the last 136' the lithology was primarily a very dense limestone packstone. This limestone packstone was tan to cream to white, some medium to dark brown, cryptocrystalline, trace of microcrystalline, occasionally argillaceous, slightly anhydritic, very slightly oolitic, with thin streaks of tan to cream, microcrystalline to very finely crystalline, oolitic to very slightly oomoldic limestone grainstone, with decreasing sample shows. These limestone grainstones decreased to only very minor amounts near termination of the lateral. As so noted was a significant decrease in the background gases.

From where the 1-B zone was first penetrated, background gas readings slowly increased to 5500 units, before decreasing to 2000 units as the well path penetrated the tighter packstones. The background gases increased to an average of 7000 units, also the sample shows increased, when the lower streak of porosity was penetrated from the true vertical depth of 5553.5' to 5557'. The lateral was drilled with a 4 to 6 foot flare, through the gas buster. The majority of this gas was interpreted to be from lateral leg #1 in the 1-C zone.

Tracking the lateral leg #2 through the southeasterly direction, it is apparent that the porosity is very thin overall and is very streaky. The packstones encountered in the lateral increased significantly away from the vertical well bore of the R.U. 17-21. These zones of dense limestone packstone were interpreted as being "intermoundal" development, between mound zones of possibly deeper water and open marine deposits. Due to the amounts of dense packstone the lateral was terminated 434' short of the proposed 1600' horizontal displacement. It is apparent that the southeasterly lateral leg #2 in the 1-B zone, has only minor lateral porosity development and will have a minor influence in the water flood for production of the 1-B zone in the offsetting production well.

*The black residual staining has been called by Dr. Dave Eby & others as "bitchimum" and is also known as "dead oil" ("dd o stn" on mud logs). This staining is associated with the movement of oil over long periods of time and is a good indicator of producable hydrocarbons when associated with productive porosities, but can also be found in porosities that have been filled by anhydrites and other material at later dates.

MOBIL

**RATHERFORD UNIT #17-21
NW HORIZONTAL LATERAL **LEG #3**
1-A POROSITY BENCH
DESERT CREEK MEMBER
PARADOX FORMATION
SECTION 17, T41S, R24E
SAN JUAN, UTAH**

**GEOLOGY REPORT
by
DAVE MEADE
ROCKY MOUNTAIN GEO-ENGINEERING CORP.
GRAND JUNCTION, COLORADO
(970) 243-3044**

MICROFICHE

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WELL SUMMARY

OPERATOR: MOBIL EXPLORATION & PRODUCTION U.S. INC.

NAME: RATHERFORD UNIT #17-21 NW HORIZONTAL LATERAL
LEG #3 IN THE DESERT CREEK 1-A POROSITY BENCH

LOCATION: SECTION 17, T41S, R24E

COUNTY/STATE: SAN JUAN, UTAH

ELEVATION: KB:4751' GL:4739'

SPUD DATE: 4/18/98

COMPLETION DATE: 4/27/98

DRILLING ENGINEER: BENNY BRIGGS / SIMON BARRERA

WELLSITE GEOLOGY: DAVE MEADE / MARVIN ROANHORSE

MUDLOGGING ENGINEERS: DAVE MEADE / MARVIN ROANHORSE / LUKE TITUS

CONTRACTOR: BIG "A" RIG 25
TOOLPUSHER: J. DEES

HOLE SIZE: 4 3/4"

CASING RECORD: SIDETRACK IN WINDOW AT 5324' MEASURED DEPTH

DRILLING MUD: M-I DRILLING FLUIDS
ENGINEER: RON WESTENBERG
MUD TYPE: FRESH WATER & BRINE WATER W/ POLYMER SWEEPS

DIRECTIONAL DRILLING CO: SPERRY-SUN

ELECTICAL LOGGING: NA

TOTAL DEPTH: 6959' MEASURED DEPTH; TRUE VERTICAL DEPTH-5522.7'

STATUS: TOH & LAY DOWN TOOLS – PREPARE WELL FOR LEG #4

DRILLING CHRONOLOGY
RATHERFORD UNIT #17-21
NW 1-A HORIZONTAL LATERAL LEG #3

DATE	DEPTH	DAILY	ACTIVITY
4/24/98	6576'/5309'	8'	DISPLACE HOLE W/BRINE-TOH-L.D. WHIPSTOCK #2-PICK UP WHIPSTOCK #3 & STARTER MILL-ORIENT-TIH-SET WHIPSTOCK-CIR BTMS UP-MILL W/STARTER MILL 5309' TO 5311'-DISPLACE HOLE W/BRINE-TOH-L.D. STARTER MILL-PICK UP WINDOW & WATERMELLON MILLS-TIH-CIR-MILL 5311' TO 5317'-PUMP 10 BBL SWEEP& CIR OUT-DISPLACE HOLE W/BRINE-L.D 66 JTS AOH-TOH-L.D. MILLS-PICK UP & ORIENT HORIZONTAL DRLG ASSEMBLY-TEST MWD & MUD MOTOR-TIH
4/25/98	5317'	169'	TIH-CIR BTMS UP THRU CHOKE-W/25 PPM H ₂ S-RIG UP GYRO DATA-RUN GYRO-TIME DRLG 5317' TO 5320'-DIR DRLG W/WIRE SURVEYS TO 5346'-PULL GYRO & RIG DOWN GYRO DATA-DIR DRLG & SURVEYS
4/26/98	5486'	494'	DIR DRLG & SURVEYS
4/27/98	5980'	979'	DIR DRLG & SURVEYS TO 6959'-PUMP SWEEP & CIR SPLS
4/28/98	6959'	TD	

DAILY ACTIVITY

Operator: MOBIL

Well Name: RATHERFORD UNIT #17-21 NW 1-A HORIZONTAL LATERAL LEG #3

DATE	DEPTH	DAILY	DATE	DEPTH	DAILY
4/24/98	6576'/5309'	8'			
4/25/98	5317'	169'			
4/26/98	5486'	494'			
4/27/98	5980'	979'			
4/28/98	6959'	TD			

BIT RECORD

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #17-21 NW 1-A HORIZONTAL LATERAL LEG #3

RUN	SIZE	MAKE	TYPE	IN/OUT	FTG	HRS	FT/HR
1	4 3/4"	STC	MF-37P	5317'/ 6959'	1642'	66.5	24.7

MUD REPORT

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #17-21 NW 1-A HORIZONTAL LATERAL LEG #3

DATE	DEPTH	WT	VIS	PLS	YLD	GEL	PH	WL	CK	CHL	CA	SD	OIL	WTR
4/24/98	5309'	9.0	27	2	1	0/0	11.0	NC	NC	92K	4680	—	5%	95%
4/25/98	5332'	9.0	27	2	1	0/0	11.0	NC	NC	96K	4480	1	3%	96%
4/26/98	5535'	9.0	27	2	1	0/0	12.0	NC	NC	87K	4400	1	3%	96%
4/27/98	6293'	9.0	27	2	1	0/0	11.0	NC	NC	74K	4600	1	2%	97%

SPERRY-SUN DRILLING SERVICES
SURVEY DATA

Customer ... : Mobil (Utah)
Platform ... : RATHERFOED UNIT
Slot/Well .. : BA25/17-21, 3A1

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	TVD	NORTHINGS FEET	EASTINGS FEET	VERTICAL SECTION	DOG LEG
5300.00	0.19	151.63	5299.80	15.66 S	27.76 E	-31.52	0.00
5309.00	0.08	178.48	5308.80	15.68 S	27.77 E	-31.54	1.38
5317.00	3.20	308.00	5316.80	15.55 S	27.59 E	-31.32	40.64
5337.00	8.20	305.30	5336.69	14.38 S	25.99 E	-29.33	25.03
5357.00	13.60	302.50	5356.32	12.29 S	22.84 E	-25.56	27.12
5377.00	19.30	299.80	5375.50	9.38 S	17.98 E	-19.95	28.75
5397.00	25.20	297.70	5394.00	5.76 S	11.34 E	-12.48	29.76
5417.00	31.70	296.60	5411.57	1.42 S	2.86 E	-3.13	32.60
5437.00	38.00	296.30	5427.98	3.67 N	7.37 W	8.06	31.51
5457.00	43.80	299.10	5443.09	9.77 N	18.94 W	20.94	30.41
5477.00	49.40	300.80	5456.83	17.03 N	31.52 W	35.32	28.67
5497.00	55.10	302.70	5469.07	25.35 N	44.96 W	51.04	29.47
5517.00	59.70	304.40	5479.84	34.67 N	58.99 W	67.83	24.09
5537.00	64.40	305.70	5489.21	44.81 N	73.45 W	85.47	24.19
5557.00	68.60	305.80	5497.19	55.53 N	88.33 W	103.79	21.00
5577.00	73.10	305.70	5503.75	66.56 N	103.66 W	122.67	22.50
5597.00	77.40	305.90	5508.84	77.87 N	119.34 W	141.99	21.52
5617.00	83.30	306.80	5512.19	89.56 N	135.22 W	161.69	29.83
5643.00	89.90	308.60	5513.73	105.42 N	155.74 W	187.63	26.31
5667.00	89.70	310.10	5513.81	120.64 N	174.30 W	211.62	6.31
5698.00	89.20	309.50	5514.11	140.48 N	198.11 W	242.60	2.52
5730.00	89.80	309.80	5514.39	160.90 N	222.75 W	274.59	2.10
5761.00	89.60	309.50	5514.55	180.68 N	246.62 W	305.57	1.16
5793.00	89.00	308.60	5514.94	200.83 N	271.47 W	337.57	3.38
5825.00	89.10	308.50	5515.47	220.77 N	296.49 W	369.56	0.44
5856.00	88.10	308.50	5516.23	240.07 N	320.74 W	400.55	3.23
5888.00	89.00	308.50	5517.04	259.98 N	345.78 W	432.54	2.81
5920.00	90.00	309.50	5517.32	280.12 N	370.65 W	464.53	4.42
5952.00	91.30	309.80	5516.96	300.53 N	395.28 W	496.51	4.17
5984.00	90.30	309.30	5516.51	320.91 N	419.95 W	528.50	3.49
6015.00	88.40	308.70	5516.86	340.41 N	444.04 W	559.49	6.43
6047.00	88.10	308.80	5517.84	360.44 N	468.99 W	591.47	0.99
6079.00	87.70	307.60	5519.01	380.21 N	494.12 W	623.45	3.95
6111.00	88.50	306.60	5520.07	399.50 N	519.62 W	655.43	4.00
6142.00	90.00	306.80	5520.48	418.03 N	544.48 W	686.42	4.88
6174.00	90.50	306.60	5520.34	437.15 N	570.13 W	718.41	1.68
6205.00	89.10	306.90	5520.45	455.70 N	594.97 W	749.40	4.62
6237.00	88.50	305.90	5521.12	474.68 N	620.72 W	781.38	3.64

SPERRY-SUN DRILLING SERVICES
SURVEY DATA

Customer ... : Mobil (Utah)
Platform ... : RATHERFOED UNIT
Slot/Well .. : BA25/17-21, 3A1

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	TVD	NORTHINGS FEET	EASTINGS FEET	VERTICAL SECTION	DOG LEG
6269.00	89.00	304.90	5521.81	493.21 N	646.80 W	813.34	3.49
6301.00	90.40	305.80	5521.98	511.73 N	672.90 W	845.30	5.20
6333.00	89.10	304.80	5522.12	530.22 N	699.01 W	877.27	5.13
6365.00	90.90	305.40	5522.12	548.62 N	725.19 W	909.22	5.93
6396.00	91.80	304.90	5521.39	566.46 N	750.53 W	940.18	3.32
6428.00	90.40	305.20	5520.78	584.83 N	776.72 W	972.13	4.47
6460.00	89.90	306.00	5520.69	603.46 N	802.74 W	1004.10	2.95
6492.00	90.30	305.40	5520.64	622.13 N	828.73 W	1036.07	2.25
6523.00	90.80	306.00	5520.34	640.22 N	853.90 W	1067.05	2.52
6554.00	91.90	306.20	5519.61	658.48 N	878.94 W	1098.02	3.61
6586.00	88.40	306.40	5519.53	677.42 N	904.73 W	1130.00	10.96
6618.00	88.00	306.90	5520.53	696.52 N	930.39 W	1161.98	2.00
6650.00	89.50	306.90	5521.23	715.72 N	955.97 W	1193.96	4.69
6681.00	90.00	308.30	5521.36	734.64 N	980.53 W	1224.96	4.80
6712.00	89.80	308.80	5521.42	753.96 N	1004.78 W	1255.96	1.74
6744.00	90.30	308.10	5521.39	773.86 N	1029.84 W	1287.96	2.69
6776.00	89.80	307.10	5521.36	793.38 N	1055.19 W	1319.95	3.49
6808.00	89.60	307.20	5521.53	812.71 N	1080.70 W	1351.95	0.70
6839.00	88.90	308.30	5521.94	831.68 N	1105.20 W	1382.95	4.21
6871.00	89.00	308.30	5522.52	851.51 N	1130.31 W	1414.94	0.31
6903.00	89.70	308.50	5522.89	871.39 N	1155.39 W	1446.94	2.28
6935.00	90.40	308.30	5522.86	891.26 N	1180.47 W	1478.94	2.28
6959.78	90.40	308.30	5522.69	906.62 N	1199.91 W	1503.72	0.00

THE DOGLEG SEVERITY IS IN DEGREES PER 100.00 FEET.
N/E COORDINATE VALUES GIVEN RELATIVE TO WELL HEAD.
TVD COORDINATE VALUES GIVEN RELATIVE TO WELL HEAD.
THE VERTICAL SECTION ORIGIN IS WELL HEAD.
THE VERTICAL SECTION WAS COMPUTED ALONG 308.00 (TRUE).
CALCULATION METHOD: MINIMUM CURVATURE.

SURVEY 6959.78' IS PROJECTED TO BIT AT TD

SAMPLE DESCRIPTIONS

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #17-21 NW 1-A HORIZONTAL LATERAL LEG #3

DEPTH	LITHOLOGY
5317.00 5330.00	"LS tan-ltbrn-gybrn,occ crm-wh,crpxl,occ micxl,v sl anhy,occ rthy-sl arg,chk ip,dns,tt,NFSOC,w/scat bf-brn CHT frag,v rr v thn calc rthy lt-mgy SH lams & v rr arg lmy gybrn micxl DOL lams"
5330.00 5350.00	"LS brn-ltbn,occ gybrn,crm-wh,crpxl-micxl,rthy,arg,v sl slty,bcmg mrly ip,occ chk,anhy,dns,chtty-rr trnsf-bf CHT frag,rr fos frag,dns,tt,NFSOC,w/scat ltgy-gy-gybrn plty mica sl slty v sl carb calc-sl dol SH lams-incl & gybrn-brn micxl lmy mrly DOL lams"
5350.00 5360.00	"LS AA,v slty-grdg to v lmy ltgy-crm SLTST,chk ip,incr mic fos,dol-mrly ip,dns,tt,NFSOC,scat ltbrn-trnsf CHT frag,tr lt-dkgy plty sl carb mica SH lams-incl,v rr dns mrly calc DOL frag,tt NFSOC"
5360.00 5370.00	"LS AA,tt,NFSOC,w/lt-dkgy-blk SH plty mica sl slty dol-calc occ carb,v thn SLTST lams,scat CHT frag AA"
5370.00 5380.00	"LS tan-brn,occ crm-wh,crpxl,micxl,occ arg,rthy,anhy-v rr ANHY xl,mic fos,decr SH & SLTST incl AA,tt,NFSOC"
5380.00 5390.00	"LS wh-crm,occ bf-tan,crpxl,rr micxl,chk,occ plty,v rr mic fos,sl styl,chtty ip,dns,tt,NFSOC,w/v rr bf-trnsf CHT frag & rr SH lams"
5390.00 5400.00	"LS AA,occ vfxl-gran,abnt ANHY cmt-POR fl,tt-rr intxl POR,v rr spty bri yel FLOR,n vis STN,n-v p slow dif CUT,abnt trnsf-bf-smky gybrn CHT frag"
5400.00 5410.00	"LS crm-wh-tan,occ ltbrngy-ltbrn,tr ltgy,crpxl,rr micxl,chk plty-sl anhy/tr xln ANHY-POR fl,tr sl slty-sdy strk,CHT AA-rr fos,pred dns,tt/rr frac-intxl-vug POR,rr bri yel FLOR,n-tr ltbrn/pp blk dd o STN,fr dif-slow stmg mlky CUT"
5410.00 5420.00	"LS ltgybrn-brn,occ crm-tan,tr dkbrn,wh,crpxl-micxl,rthy-chky-rr slty,occ arg-sl shy,dns-chtty,tr CHT AA,rr mic fos,sl dol ip,tt,NFSOC"
5420.00 5430.00	"LS tan-crm-wh,occ ltbrngy,tr brn,ltgy,crpxl-micxl,chk plty-sl anhy/tr xln ANHY-POR fl,CHT AA,rr fos,dns,tt/rr frac-intxl-vug POR,tr dull-bri yel FLOR,n-tr ltbrn STN,fr dif-slow stmg mlky CUT"
5430.00 5440.00	"LS AA,chk plty-sl anhy AA,CHT AA,rr CALC xl,dns,tt/tr frac-intxl-vug POR,incr FLOR,STN-CUT AA"
5440.00 5450.00	"LS m-ltgy mot/blk-dkgy arg-calc sl carb SH,occ tan-crm-wh,tr brn,micxl-crpxl,rthy,occ grdg to lmy-calc slty carb SH ip,sl chky-anhy/rr xln ANHY,tr CHT AA,v rr intxl-frac POR,decr FLOR AA,STN-CUT AA"

DEPTH	LITHOLOGY
5450.00 5470.00	"LS crm-tan-wh,occ lt-mgybrn,tr brn-dkbrngy,ltgy,crpxl-micxl,chk plty-sl anhy/tr xln ANHY-POR fl,tr blk SH mot AA,dkbrn-blk-crm CHT,rr CALC xl & mic fos,dns,tt/rr frac-intxl POR,rr-tr dull-spty bri yel FLOR,n-tr ltbrn STN,fr dif-slow stmg mlky CUT"
5470.00 5480.00	"LS m-dkgy-gybrn,dkbrnblk,occ ltgy,tan,brn,micxl,occ crpxl,rthy-sl slty,arg-sl shy,occ mot AA,occ grdg to calc-dol sl carb SH,tr CHT AA,tt,NFSOC"
5480.00 5490.00	"LS m-ltgybrn-brn,occ ltgy,tr dkbrn,crpxl,occ micxl-xfxl,rthy,sl shy-arg-decr mot AA/intbd slty-sdy strk,ckky-sl anhy,tr f gr QTZ-occ grdg to f gr SS/lmy-calc mtx,rr CHT-xl ANHY,tt,n vis POR,NSOC"
5490.00 5510.00	"LS m-ltgy,m-dkbrn decr/depth,tr dkbrnblk,wh,micxl-vfxl,crpxl,bcmg sdy-slty grdg to dns SS AA,intbd/sl mot dol shy dns prtgs grdg to calc-dol SH,rr brn-crm CHT,v rr dism PYR,tt,NFSOC"
5510.00 5520.00	"LS crm-tan-ltbrn,occ brn,crpxl-micxl,cln-rthy,arg-v sl slty,occ dol ip,scat ltgy v lmy SLTST ptgs,v rr trnsi-brn CHT frag,dns,tt,NFSOC,w/v rr thn brn-mbrn micxl lmy sl arg DOL lams/incl,tt-v rr intxl POR,v p FLOR-STN-CUT"
5520.00 5530.00	"LS PKST v sl fos dns tt NFSOC AA v rr CHT frag,w/DOL incl-brn-mbrn micxl arg-rthy v sl slty lmy occ shy w/thn ANHY stks tt-tr intxl POR,mfr dull yel FLOR,rr ltbrn STN,v p slow dif-slow stmg CUT,scat rr SH lams"
5532.00 5540.00	"LS crm-gy,occ tan,crpxl,dns,sl anhy,v sl dol,slty ip,rr styl,dns,tt,NFSOC,w/v rr thn DOL AA,scat trnsi-fr CHT frag,"
5540.00 5550.00	"LS wh-ltgy-gy,occ tan,crpxl,PKST AA,v rr thn arg brn DOL AA,rr scat CHT frag,bcmg carb SH"
5550.00 5580.00	"SH blk-dkgy,sbblky-sbplty,sft-mfrm,rthy,sl slty,mica,calc-dol,carb-sooty,w/scat tr dns LS & v arg rthy shly DOL frag incr w/depth"
5580.00 5590.00	"SH AA,bcmg LS brn-mbrn,occ crm-tan,crpxl-sl micxl,dns,cln-rthy,sl plty-chk,sl arg,v sl dol,rr Crin fos,anhy-rr ANHY incl,tt,NFSOC,w/rr thn stks mbrn micxl dns sl fos lmy tt DOL"
5590.00 5600.00	"LS AA,bcmg pred ltgy-wh sl slty anhy plty,dns,tt-v rr spty intxl POR,n-tr dull yel FLOR,n vis STN,v p slow dif CUT,scat DOL ptgs m-dkbrn crpxl-micxl v arg sl lmy arg tt NFSOC,w/v rr v thn blk carb SH lams & trnsi-bf CHT frag"
5600.00 5610.00	"LS crm-tan-brn,occ wh-ltgy,pred crpxl anhy PKST,bcmg micxl-vfxl v sl ool GRNST,v rr bf CHT frag,scat DOL-SH cvgs,rr ANHY xl-incl,tt-mfr intxl-tr ool POR,tr-fr dull-bri yel FLOR,tr spty brn-v rr blk STN,tr slow-rr fast CUT"

DEPTH	LITHOLOGY
5610.00 5620.00	"LS AA,decr DOL-SH cvgs,bcmg ooc-oom,incr POR-FLOR-STN-CUT"
5620.00 5630.00	"LS pred crm-tan,occ ltbrn,crpxl-vfxl,gran-micsuc ip,ooc-oom GRNST,scat dns plty wh-crm tan v sl ool anhy PKST,v rr CHT frag,occ anhy,tt-fr intxl-ool POR,fr dull-bri yel FLOR,mfr ltbrn-brn-rr blk STN,tr slow-fr fast stmg CUT"
5630.00 5650.00	"LS tan-crm,occ wh-ltbrn,crpxl-vfxl,occ gran,rr micsuc,ooc-oom GRNST,scat rr dns occ plty-chk v sl ool PKST,anhy-sl dol cmt,rr ANHY xl-CHT frag,fr-mg intxl-ool POR,fr-g dull-bri yel FLOR,fr ltbrn-brn STN-rr blk dd o STN,fr-mg mod fast-tr slow stmg CUT"
5650.00 5660.00	"LS AA,pred ooc-oom GRNST,occ DOL rich cmt,scat dns PKST,fr-g POR-FLOR-STN-CUT"
5660.00 5670.00	"LS AA,micxl-vfxl,occ gran,crpxl,rr micsuc,ooc-oom GRNST,scat tr dns sl ool-rr plty chky PKST,anhy-sl dol cmt,tr ANHY xl,rr CHT frag,g ool-intxl POR,fr-g dull-spty bri yel FLOR,fr ltbrn-brn/tr pp blk dd o STN,fr dif/tr mod fast-slow stmg mlky CUT"
5670.00 5690.00	"LS AA,vfxl-gran-sl micsuc,rr crpxl,ooc-oom GRNST/tr scat PKST AA,anhy/tr ANHY xl-POR fl,v rr CHT,v rr dol ip,g ool-tr intxl POR,FLOR AA,fr ltbrn-tr brn/blk dd o STN,g mod fast-slow stmg mlky CUT"
5690.00 5720.00	"LS tan-crm-ltbrn,occ wh,vfxl-gran-sl micsuc,rr crpxl,ooc-oom GRNST/tr PKST AA,sl anhy/tr ANHY xl-POR fl,v rr crm-brn CHT,v rr dol ip,g ool-tr intxl POR,g dull-spty bri yel FLOR,fr ltbrn-tr brn/blk dd o STN,g-fr slow-mod fast stmg mlky CUT"
5720.00 5740.00	"LS AA/sl incr ltbrn-brn,vfxl-gran-sl micsuc,rr crpxl,suc ip,ooc-oom GRNST,scat tr dns sl ool-chky plty PKST,sl anhy/tr ANHY xl-POR fl,v rr CHT AA,v rr dol strk ip,g ool-tr intxl POR,FLOR AA,fr ltbrn-tr brn/blk dd o STN,g mod fast-slow stmg mlky CUT"
5740.00 5760.00	"LS tan-crm,occ ltbrn,tr brn,wh,vfxl-gran-sl micsuc,rr crpxl,ooc-oom GRNST,scat tr dns sl ool-rr chky plty PKST,anhy/tr POR fl-rr xln ANHY,v rr crm-tan CHT,POR AA,g scat spty mod bri-bri yel FLOR,fr ltbrn-tr brn/blk dd o STN,g mod fast-slow stmg mlky CUT"
5760.00 5780.00	"LS AA,vfxl-gran-sl micsuc,rr crpxl-suc,ooc-oom GRNST/tr scat dns sl ool-chky plty PKST,anhy/tr POR fl,v rr CHT & xl ANHY,v sl dol ip,g ool-tr intxl POR,g even mod bri-spty bri yel FLOR,fr ltbrn-tr brn/blk dd o STN,g mod fast-slow stmg mlky CUT"
5780.00 5800.00	"LS tan-crm-wh,occ ltbrn,tr brn,vfxl-gran-micsuc,tr micxl-crpxl,GRNST AA,tr scat dns sl ool PKST,chky-sl anhy/tr POR fl-rr xln ANHY,rr crm-tan CHT incl,occ sl dol,g ool/tr intxl POR,g scat mod bri/spty bri yel FLOR,fr-g ltbrn/tr brn-blk dd o STN,CUT AA"

DEPTH	LITHOLOGY
5800.00 5820.00	"LS tan-crm-off wh,ltbrn,occ brn,vfxl-gran-micsuc,tr micxl-crpxl,ool-oom GRNST/tr scat dns sl ool PKST,chky-sl anhy/tr POR fl-rr xln ANHY,rr CHT AA,occ sl dol strk,g ool/tr intxl POR,FLOR-STN-CUT AA"
5820.00 5840.00	"LS AA,vfxl-gran-micsuc,tr micxl-crpxl,GRNST AA/tr scat PKST AA,chky-sl anhy/tr POR fl-rr xln ANHY,rr crm-tan CHT incl,occ sl dol strk,g ool/tr intxl POR,g scat mod bri/spty bri yel FLOR,fr-g ltbrn/tr brn-blk dd o STN,g slow-mod fast stmg mlky CUT"
5840.00 5850.00	"LS AA,ool-oom GRNST/tr scat dns sl ool-vrr chky plty PKST,sl anhy/tr POR fl-v rr xln ANHY,rr CHT AA,tr sl dol strk,POR-FLOR AA,fr-g ltbrn/tr brn-rr blk dd o STN,g mod fast-fast stmg mlky CUT"
5850.00 5880.00	"LS tan-crm,occ wh,ltbrn,tr brn,vfxl-gran-micsuc,tr micxl-crpxl,GRNST AA,tr scat dns sl ool PKST,chky-sl anhy/tr POR fl-xln ANHY,v rr crm CHT,sl dol/tr DOL rich cmt ip,POR AA,g even mod bri/bri yel FLOR,fr-g ltbrn/tr brn-blk pp dd o STN,CUT AA"
5880.00 5900.00	"LS tan-crm,tr ltbrn,off wh,rr brn,vfxl-gran-micsuc,tr suc-crpxl,ool-oom GRNST,tr scat dns sl ool-dol PKST,chky-anhy/tr POR fl-xln ANHY,tr DOL cmt,v rr crm CHT,POR-FLOR AA,g-fr ltbrn/tr brn-blk pp dd o STN,g mod fast-slow stmg mlky CUT"
5900.00 5920.00	"LS AA,vfxl-gran-micsuc,tr micxl-crpxl,GRNST AA/sl incr scat dns sl ool PKST,chky-anhy/tr POR fl-xln ANHY,tr crm-ltbrn CHT,occ sl dol,g-fr ool/tr intxl POR,g scat mod bri-spty bri yel FLOR,fr-g ltbrn/tr brn-blk dd o STN,CUT AA"
5920.00 5930.00	"LS AA,GRNST AA/tr scat dns sl ool PKST,chky-anhy/tr POR fl-xln ANHY,rr crm-ltbrn CHT,occ sl dol,POR AA,g even mod bri-spty bri yel FLOR,fr-g ltbrn/tr brn-blk dd o STN,g mod fast-fast stmg mlky CUT"
5930.00 5950.00	"LS tan-crm-ltbrn,tr brn,off wh,vfxl-gran-micsuc,tr micxl-crpxl,ool-oom GRNST/tr scat dns sl ool PKST,chky-anhy/tr POR fl-xln ANHY,rr CHT AA,occ dol/tr DOL cmt,g ool/tr intxl POR,g scat mod bri-spty bri yel FLOR,fr-g ltbrn/tr brn-blk dd o STN,CUT AA"
5950.00 5970.00	"LS tan-crm-ltbrn,occ off wh,tr brn,vfxl-gran-micsuc,micxl-crpxl,GRNST AA,intbd-scat dns sl ool PKST,chky-anhy/tr POR fl-xln ANHY,rr CHT AA,sl dol/tr DOL rich cmt,g ool/tr intxl POR,g scat mod bri-spty bri yel FLOR,STN AA,g fast-sl blooming mlky CUT"
5970.00 5990.00	"LS AA,gran-micsuc-vfxl,decr crpxl,GRNST AA/decr intbd-scat dns sl ool PKST,chky-anhy/tr POR fl-rr xln ANHY,v rr CHT AA,v sl dol,g ool/tr intxl POR,sl incr scat mod bri-spty bri yel FLOR,g-fr ltbrn/tr brn-blk pp dd o STN,g fast-mod fast stmg mlky CUT"

DEPTH	LITHOLOGY
5990.00 6010.00	"LS tan-ltbrn,occ crm-off wh,brn,vfxl-gran-micsuc,micxl-crpxl,GRNST AA,tr intbd-scat dns sl ool PKST,chky-anhy/tr POR fl-rr xln ANHY,v rr CHT AA,v sl dol,g ool/tr intxl POR,g scat spty bri-mod bri yel FLOR,g ltbrn/incr brn-tr blk pp dd o STN,CUT AA"
6010.00 6030.00	"LS AA,vfxl-gran-micsuc,micxl-crpxl,ool-oom GRNST/tr PKST AA,chky-sl anhy/tr POR fl-rr xln ANHY,v rr CHT AA,v sl dol,g ool/tr intxl POR,g scat spty bri-mod bri yel FLOR,STN AA,g fast-mod fast stmg mlky CUT"
6030.00 6060.00	"LS tan-crm-ltbrn,occ off wh,tr brn,vfxl-micsuc-gran,micxl-crpxl,GRNST AA,tr scat-intbd dns sl ool PKST,incr chky-anhy/POR fl-rr xln ANHY,tr tan-ltbrn CHT,v sl dol,POR-FLOR AA,g-fr ltbrn/tr brn-blk dd o STN,g slow/tr mod fast stmg mlky CUT"
6060.00 6080.00	"LS AA,micxl-vfxl,gran-sl micsuc-occ crpxl,pred ool-sl oom GRNST,sl incr scat-intbd dns sl ool PKST,incr chky-sl anhy/POR fl-tr xln ANHY,rr crm-tan CHT,sl dol/tr DOL cmt,POR AA,sl incr FLOR AA,STN-CUT AA"
6080.00 6100.00	"LS AA,vfxl-gran,micxl-micsuc-crpxl,GRNST AA,tr intbd-scat dns sl ool PKST,chky-anhy/tr POR fl-rr xln ANHY,v rr CHT,sl dol ip,g ool/tr intxl POR,g scat spty bri-mod bri yel FLOR,g-fr ltbrn/tr brn-blk dd o STN,g slow-mod fast stmg mlky CUT "
6100.00 6110.00	"LS AA,ool-sl oom GRNST/tr intbd-scat dns sl ool PKST,sl chky-anhy/tr POR fl-rr xln ANHY,v rr CHT AA,v sl dol ip,POR-FLOR-STN AA,g slow-mod fast CUT "
6110.00 6130.00	"LS tan-crm-ltbrn,occ off wh,brn,vfxl-gran-micsuc,occ crpxl,GRNST AA/sl incr intbd-scat PKST AA,chky-anhy/tr POR fl-v rr xln ANHY,v rr tan-bf CHT,v sl dol,POR AA,g scat spty bri-mod bri yel FLOR,g ltbrn/tr brn-blk dd o STN,g fast-mod fast stmg mlky CUT "
6130.00 6150.00	"LS tan-ltbrn,occ crm-off wh,brn,vfxl-gran-micsuc,micxl-crpxl,GRNST AA/tr intbd-scat dns sl ool PKST,chky-anhy/tr POR fl-rr xln ANHY,v rr CHT AA,v sl dol,g ool/tr intxl POR,g scat spty bri-mod bri yel FLOR,g ltbrn/incr brn-tr blk pp dd o STN,CUT AA"
6150.00 6160.00	"LS AA,pred ooc-oom GRNST,w/scat rr sl ool dns anhy PKST frag,g ool-fr intxl POR,fr-mg dull-bri yel FLOR,fr-g ltbrn-brn STN,rr spty blk dd o STN,fr-g mod fast-fast stmg CUT"
6160.00 6190.00	"LS tan-ltbrn,occ crm-brn,crpxl-vfxl,tr gran-micsuc,pred ooc-oom GRNST,rr-tr scat dns sl ool occ chk PKST,anhy-rr ANHY xl-POR fl,v rr bf CHT frag,v sl dol,g ool-tr intxl POR,g bri-dull yel FLOR,fr-g ltbrn-brn STN-tr blk dd o STN,fr-mg mod fast-fast CUT"
6190.00 6210.00	"LS AA,pred ooc-oom GRNST,scat dns sl ool anhy PKST,tr trnsi-rr bf CHT frag,fr FLOR-STN-CUT"

DEPTH	LITHOLOGY
6210.00 6230.00	"LS tan-ltbrn,occ crm-brn,crpxl-vfxl,tr gran-micsuc,pred ooc-oom GRNST,rr-tr scat dns sl ool occ chk PKST,anhy-rr ANHY xl-POR fl,rr trns1 CHT frag,sl dol,g ool-tr intxl POR,g bri-dull yel FLOR,fr-g ltbrn-brn STN-tr blk dd o STN,fr-mg mod fast-fast CUT"
6230.00 6260.00	"LS AA,sl incr vfxl-gran,micsuc ip,incr intxl POR,fr-mg FLOR-STN-CUT AA"
6260.00 6280.00	"LS tan-brn,occ crm-wh,crpxl-vfxl,gran-micsuc ip,pred ooc-oom GRNST,rr scat dns sl ool occ chk anhy ip PKST,rr ANHY xl-POR fl,rr trns1 CHT frag,tr DOL cmt,g ool-fr intxl POR,g bri-dull yel FLOR,fr ltbrn-brn STN-tr blk dd o STN,fr-mg mod fast-fast stmg CUT"
6280.00 6300.00	"LS AA,bcmg brn wh-crm-ltgy plty chky v sl slty dns tt PKST w/v rr ool & ANHY stks-rr ANHY fl POR,tt-mg intxl-ool POR,tr-fr dull-bri yel FLOR,mfr-fr brn STN,no-mg slow-fast stmg mlky CUT "
6300.00 6320.00	"LS tan-brn,occ crm-wh,crpxl-vfxl,gran-micsuc ip,pred ooc-oom GRNST,rr scat dns sl ool occ chk anhy ip PKST,rr ANHY xl-POR fl,rr trns1 CHT frag,tr DOL cmt,g ool-fr intxl POR,g bri-dull yel FLOR,fr ltbrn-brn STN-tr blk dd o STN,fr-mg mod fast-fast stmg CUT"
6320.00 6340.00	"LS tan-ltbrn,rr crm-ltgy,micxl-vfxl,gran-micsuc ip,pred ooc-oom GRNST,w/scat dns occ chk-plty v sl ool PKST,sl anhy,rr ANHY xl-POR fl,sl dol cmt,v rr CHT frag,fr-mg intxl-ool POR,mg dull-bri yel FLOR,fr brn-tr blk STN,fr-mg mod fast-fast stmg CUT"
6340.00 6350.00	"LS AA,pred ooc-oom GRNST AA,w/rr scat dns v sl ool PKST,fr-g intxl-mg ool POR,fr-g bri-tr dull yel FLOR,mfr ltbrn-brn STN-rr spty dkbrn-blk dd o STN,fr-g mod fast-fast stmg CUT"
6350.00 6360.00	"LS pred ooc-oom GRNST AA,v sl incr brn-mbrn dns v sl arg crpxl occ plty PKST frag,rr-tr trns1-clr-bf CHT frag,v sl decr POR-FLOR-STN-CUT"
6360.00 6390.00	"LS tan-ltbrn,rr crm,crpxl-vfxl,occ gran-micsuc,intbd ooc-oom GRNST & dns v sl ool anhy occ plty PKST,rr CHT frag,v rr DOL cmt,scat ANHY xl,tt-g intxl-ool POR,mg dull-bri yel FLOR,tr-mfr ltbrn-rr spty blk STN,mfr-fr slow-tr mod fast stmg CUT"
6390.00 6420.00	"LS tan,occ crm-ltbrn,crpxl-vfxl,occ gran-micsuc,sl ooc-oom GRNST,w/v rr scat dns sl ool anhy PKST lams,occ sl DOL cmt,scat ANHY xl-POR fl,tr scat trns1 CHT frag,fr-mg intxl-tr ool POR,mfr-fr dull-bri yel FLOR,tr spty brn-rr blk STN,mfr slow-mod fast CUT"
6420.00 6430.00	"LS AA,sl incr dns ool-v sl fos PKST,sl decr POR-FLOR-STN-CUT"
6430.00 6440.00	"LS AA,sl incr vfxl-gran,micsuc ip,incr intxl POR,mfr FLOR-STN-CUT AA"

DEPTH	LITHOLOGY
6440.00 6460.00	"LS tan-ltbrn,rr crm,crpxl-vfxl,occ gran-micsuc,intbd ooc-oom GRNST & dns v sl ool anhy occ plty PKST,rr CHT frag,v rr DOL cmt,scat ANHY xl,tt-g intxl-ool POR,mg dull-bri yel FLOR,tr-mfr ltbrn-rr spty blk STN,mfr-fr slow-tr mod fast stmg CUT"
6460.00 6480.00	"LS tan-ltbrn,rr crm-ltgy,micxl-vfxl,gran-micsuc ip,pred ooc-oom GRNST,w/scat dns occ chk-plty v sl ool PKST,sl anhy,rr ANHY xl-POR fl,sl dol cmt,v rr CHT frag,fr-mg intxl-ool POR,mg dull-bri yel FLOR,fr brn-tr blk STN,fr-mg mod fast-fast stmg CUT"
6500.00 6520.00	"LS pred g ooc-oom GRNST AA,w/sl incr PKST w/depth,v rr ANHY-DOL cmt,scat trnsf-bf CHT frag,rr ANHY xl-POR fl,fr-g intxl-ool POR,fr-mg dull-bri yel FLOR,tr-fr ltbrn STN-v rr spty blk dd o STN,fr-mg mod fast-tr fast stmg CUT"
6520.00 6560.00	"LS tan,occ ltbrn-crm,micxl-vfxl,gran-micsuc ip,pred ooc-oom GRNST,w/scat dns occ chk-plty v sl ool PKST,sl anhy-rr ANHY xl-POR fl,rr DOL cmt,v rr CHT frag,tt-mg intxl-fr ool POR,fr dull-bri yel FLOR,tr brn-rr blk STN,v p slow-fr mod fast-fast stmg CUT"
6560.00 6580.00	"LS tan-ltbrn,rr crm,crpxl-vfxl,occ gran-micsuc,intbd ooc-oom GRNST & dns v sl ool anhy occ plty PKST,rr trnsf CHT frag,v rr DOL cmt,scat ANHY xl-POR fl,tt-g intxl-ool POR,mg dull-bri yel FLOR,tr-mfr ltbrn-rr spty blk STN,mfr slow-tr mod fast stmg CUT"
6580.00 6610.00	"LS,ltbrn-tn-occ crm,sl mott,rr crpxl,pred mic-vfxl,sl suc-mdns mtx,ooc-oom-sl suc GRNST,dns-PKST,sme chky/calc fld casts,rr anhy xl,pred intxl to scat oom-oom fab POR por,mbri-bri yelgld FLOR,v-slo p-strm/dif cut,pred dkbrn-sptty blk o STN res"
6610.00 6630.00	"LS,ltbrn-tn-crm,mot,pred mic-vf xl,sl suc-sl grn-oom-oom-GRNST,tr dns-PKST,rr calc frc flgs,ool,rr fos frgs,clky cast flgs;pred m-f interxln to pr-red oom-occ fab POR,pred dkbrn-ltbrn o STN,spty blk o STN res,mbri-bri yelgld FLOR,slo-dif strm CUT"
6630.00 6650.00	"LS,ltbrn-tn-crm,mot,pred mic-vf xl,sl suc-sl grn-oom-oom-GRNST,rr dns-PKST,rr calc frc flgs,ool,rr ANHY xl,rr fos frgs,clky cast flgs;pred m-f interxln to pr-red oom-occ fab POR,pred dkbrn-ltbrn o STN,spty blk o STN res,mbri-bri yelgld FLOR,slo-dif strm CUT"
6650.00 6670.00	"LS,ltbrn-tn-crm,mott,rr crpxl,pred mic-vf xl,rr-dns-sl ool PKST,occ grn-oom-oom GRNST,rr ANHY xl,sme calc/chky fld casts,rr calc frac flgs,ool/tr pel,rr foss frgs,pred f-intxl to oom-oom fab POR,mbri-bri yelgld FLOR,slo strm/dif/CUT,pred ltbrn-dkbrn o STN"
6670.00 6690.00	"LS,ltbrn-tn,occ crm,mot,mic-pred vf xln,sl suc-oom-oom-GRNST,ool,tr pel,scat chky/calc fld casts,rr foss frgs,rr ANHY xl;pred interxln to oom/occ w/sme scat introol fab POR,m strm/dif cut,mbri-bri yelgld FLOR,pred dkbrn o STN,sptty blk o STN res"

DEPTH	LITHOLOGY
6690.00 6710.00	"LS,ltbrn-tn,occ crm,mott,mic-vf xl,pred ooc-oom GRNST,rr dns PKST,ool,sme chlky/calc cast flgs,rr calc frac flgs,clky,sl rthy;pred m-f intxl to oom-oom fab POR,sme scat introol POR,pred dkbrn O STN,sptty blk o STN res,mbri-bri yelgld FLOR,p-m slo dif CUT"
6710.00 6730.00	"LS,ltbrn-tn-crm,mot,pred mic-vf xl,sl suc-sl grn-oom-ooc-GRNST,tr dns-PKST,rr calc frc flgs,sl ool,rr fos frgs,clky cast flgs;pred m-f interxln to pr-red oom-occ fab POR,pred dkbrn-ltbrn o STN,spty blk o STN res,mbri-bri yelgld FLOR,slo-dif strm CUT"
6730.00 6760.00	"LS,ltbrn-tn-crm,mott,mic-vf xln,mdns-sl suc-occ grn mtz,pred oom-oom GRNST,rr dns-sl ool PKST,ool,rr ANHY xl,sl chlky/rthy,sme chlky/calc fld casts,rr calc frac flgs;pred m-f interxln to p-red oom/ooc fab POR,sme scat introol fab POR,mbri yelgld flor"
6760.00 6780.00	"LS,ltbrn-tn-crm,mott,rr crpxl,pred mic-vf xl,rr-dns-sl ool PKST,occ grn-ooc-oom GRNST,rr ANHY xl,sme calc/chlky fld casts,rr calc frac flgs,ool/tr pel,rr foss frgs,pred f-intxl to oom-oom fab POR,mbri-bri yelgld FLOR,slo strm/dif/CUT,pred ltbrn-dkbrn o STN"
6780.00 6800.00	"LS,ltbrn-tn-crm,mott,pred mic-vf xl,mdns-occ grn-sl suc mtz,occ grn-ooc-oom GRNST,rr ANHY xl,sme calc/chlky fld casts,rr calc frac flgs,ool/tr pel,rr foss frgs,pred f-intxl to oom-oom fab POR,mbri-bri yelgld FLOR,slo strm/dif/CUT,pred dkbrn o STN"
6800.00 6830.00	"LS,ltbrn-tn,occ crm,mot,mic-vf xln,sl suc-occ grn mtz,mdns mtz,pred oom-oom ool GRNST,rr sl ool-PKST,sl rthy,rr calc frac flgs,tr foss frgs,chlky/calc cast flgs;pred f-interxln to oom/ooc fab por,mbri-bri yelgld FLOR,m-f strm/dif CUT,pred dkbrn o STN"
6830.00 6850.00	"LS,ltbrn-tn,mot,pred vf-mic xl,sl suc-occ grn mtz,mdns mtz ip,pred oom-oom ool GRNST,ool rich,sl rthy,rr calc/chlky flgs,sl anhy;pred m-f oomoldic to oolicastic w/sme scat intrxln fab POR,dkbrn-blk O STN,p-m slo strm/dif CUT,mbri-sptty bri yelgld FLOR"
6850.00 6870.00	"LS,ltbrn-tn-crm,mot,mic-vf xln,sl suc-occ grn-mdns mtz,pred oom-oom GRNST,sme mdns-sl ool PKST,sl anhy,sl rthy,rr calc frac flgs,ool,rr foss frgs;pred oom/occ to interxln w/sme scat introol fab POR,mbri-sptty bri yelgld FLOR,pred dkbrn o STN,p-strm/difCUT"
6870.00 6900.00	"LS,ltbrn-tn,occ crm,mot,mic-vf xln,sl suc-occ grn mtz,mdns mtz,pred oom-oom ool GRNST,rr sl ool-PKST,sl rthy,rr calc frac flgs,tr foss frgs,chlky/calc cast flgs;pred f-interxln to oom/ooc fab por,mbri-bri yelgld FLOR,m-f strm/dif CUT,pred dkbrn O STN"
6900.00 6920.00	"LS,ltbrn-tn-occ crm,sl mott,rr crpxl,pred mic-vfxl,sl suc-mdns mtz,oom-oom-GRNST,dns-PKST,sme chlky/calc fld casts,rr anhy xl,pred intxl to oom-oom fab POR por,mbri-bri yelgld FLOR,v-slo p-strm/dif cut,pred dkbrn-sptty blk o STN res"

DEPTH	LITHOLOGY
6920.00 6940.00	"LS,ltbrn-tn-occ crm,mic-vf xln,sl suc-occ grn mtx,mdns mtx,pred oom-occ-sl suc GRNST,tr mdns PKST,ool,sme calc/chlky fld casts,rr foss frgs;pred interxln to pr-m oom/occ fab POR,mbri yelgld FLOR,wk slo strm/dif CUT,dkbrn o STN,sptty blk o STN res"
6940.00 6959.00	"LS,ltbrn-tn-crm,mot,pred mic-vf xl,sl suc-sl grn-oom-occ- GRNST,tr dns-sl ool PKST,rr calc frc flgs,ool,rr foss frgs,chlky cast flgs;pred m-f interxln to pr-red oom-occ fab POR,pred dkbrn-ltbrn o STN,spty blk o STN res,mbri-bri yelgld FLOR,slo-dif strm CUT"

WELL NAME: RATHERFORD UNIT #17-21 NW 1-A HORIZONTAL LATERAL LEG #3

FORMATION NAME		SAMPLE	SAMPLE	DATUM
		MEASURED DEPTH	TRUE VERTICAL DEPTH	KB:4751'
UPPER ISMAY		5359'	5358'	-607
LOWER ISMAY		5487'	5463'	-712
GOTHIC SHALE		5549'	5494'	-743
DESERT CREEK		5582'	5505'	-754
DC 1-A ZONE		5602'	5510'	-759

GEOLOGICAL SUMMARY

AND

ZONES OF INTEREST

The Mobil Exploration and Production U.S., Inc., Ratherford Unit #17-21 Northwest Horizontal Lateral Leg #3 was a re-entry of the Mobil Ratherford Unit #17-21 located in Section 17, T41S, R24E, and was sidetracked in a northwesterly direction from 5317' measured depth, 5317' true vertical depth, on April 24, 1998. The lateral reached a measured depth of 6959', true vertical depth of 5522.5' at total depth, with a horizontal displacement of 1166' and true vertical plane 141.4 degrees on April 23, 1998 in the Desert Creek 1-A porosity zone. As previously noted, during the initial preparation of the well bore, difficulty was experienced setting the oriented packer due to bad casing. The packer was finally set at 5349' instead of 5456' as originally planned. This necessitated setting the whipstock for lateral #3 about 100 feet higher than called for in the drilling plan, resulting in a curve radius of 196 feet.

After tripping in the hole with the directional drilling assembly, the well was circulated out with 25 ppm H₂S noted. Do to length of the curve radius, the curve and lateral sections of the hole were drilled without a bit trip to change the bottom hole assembly. The curve portion of the lateral was completed at a true vertical depth of 5513.7', in the 1-A porosity zone of the Desert Creek on April 26, 1998. Because the lateral was started higher than anticipated, the curve section of the hole was begun in the lower 41' of the Honaker Trail Formation of the Hermosa Group before encountering the typical section of Upper Ismay, Lower Ismay, Gothic Shale and Desert Creek members of the Upper Paradox Formation.

Objectives of the Ratherford Unit #17-21 leg #3 horizontal lateral were to penetrate and drill the 1-A porosity horizon, to identify and define the lithology, and evaluate the porosity and effective permeability of the 1-A bench of the Desert Creek. These objectives were accomplished in the 1-A zone, which showed a consistent lithology. After completing the curve portion of the lateral, the lateral section required only minor amounts of sliding to remain within the porosity zone as well as control horizontal plane direction. The well path used the proposed target line as a reference point through out the 1-A zone. Only the top of the porosity zone was encountered within the 1-A zone. The lateral section of the hole was at a horizontal displacement of 1503.7' in the good oolitic to oolmoldic grainstones of the 1-A zone. .

The basal 41 feet of the Honaker Trail Limestone was penetrated as drilling of lateral leg #3 was begun just under the whipstock. The lithology was predominately dense limestone packstone, which was light brown to light gray brown to cream, microcrystalline to cryptocrystalline with an earthy to slightly chalky texture, occasionally argillaceous, cherty, occasionally grading to very limy marlstone. Interbedded within the limestones were light gray to brown-gray shales, medium gray brown to brown, argillaceous to very slightly marly dolomites and scattered chert fragments. The zone exhibited no visible porosity, fluorescence, stain or cut. The basal shale marker at the base of the Honaker Trail lime and above Upper Ismay was represented by a light to dark gray to gray brown shale, slightly silty to micaceous, calcareous to slightly dolomitic, occasionally carbonaceous, with very thin argillaceous, marly limestone and dolomite streaks.

The top of the Upper Ismay was encountered at a measured depth of 5359', true vertical depth of 5358'. The majority of the formation, from 5359' to 5433' measured depth was characterized by a dense argillaceous to silty, cherty to slightly anhydritic limestone. The limestone was tan to cream to white and occasionally brown to some gray brown, microcrystalline to cryptocrystalline with a occasionally chalky to slightly silty texture, predominately dense and tight crystalline matrix and had very rare algal material. Rare to traces of translucent to tan to brown and occasional dark brown to smokey gray brown cherts were present plus scattered crystalline calcite and anhydrite. Scattered throughout this interval were very rare streaks of intercrystalline to pin point vuggy porosity, with rare sample shows. The argillaceous limestones were generally darker in color with a slightly silty texture, grading to a calcareous siltstone and limey shale in part. At a measured depth of 5433' through 5441', a tan to light brown, some brown, microcrystalline to very fine crystalline, very slightly algal limestone grainstone was noted. This limestone was slightly silty, with rare tan cherts, and had scattered crystalline calcite and anhydrite in filled fractures. This 8' thick interval of limestone grainstones, approximately 46' above the base of the Upper Ismay displayed a poor sample show in a very rare intercrystalline to slightly algal to fracture porosity development. The sample show displayed a poor light brown stain, a trace of spotty yellow fluorescence and a diffuse to slow streaming cut. The lower 46' of the Upper Ismay from 5441' to 5487' had very poor to no porosity development with very slight to no sample shows. From 5441' to the top of the Lower Ismay was a limestone packstone, which was cream to white to tan and occasionally gray brown to brown, cryptocrystalline to microcrystalline with a chalky to silty texture, with carbonaceous streaks and became increasingly dolomitic and shaley with depth. The zone was also slightly anhydritic with a trace of crystalline anhydrite, a scattered tan to brown chert, very rare thin argillaceous brown microcrystalline dolomite and scattered dark gray to black shale laminae. This zone displayed no to very rare intercrystalline to fracture porosity with very rare, scattered bright to dull yellow fluorescence, very rare brown stain and a poor slow streaming cut. The Hovenweep marker between the Upper and Lower Ismay members was well represented in the samples in this lateral, consisting of a very slight increase in the brown to gray brown to gray, dolomitic to calcareous, slightly silty, occasionally micaceous, very slightly fossiliferous, occasionally carbonaceous shales.

The top of the Lower Ismay was picked at a measured depth of 5487', 5463' true vertical depth, and was based primarily on sample identification and an increase in penetration rate. The lithology of the Lower Ismay from 5487' to 5519' measured depth, 5463' to 5480' true vertical depth, was predominately a white to cream to brown and occasionally light gray brown, cryptocrystalline to microcrystalline limestone, predominately earthy to silty and argillaceous with thin chalky to anhydritic streaks. This interval had minor amounts of translucent to brown chert, and had scattered black carbonaceous inclusions. The limestones displayed no visible porosity or sample shows. At a measured depth of 5519' to 5532' measured depth, 5488' true vertical depth, the lithology changed to a brown to medium brown, microcrystalline, argillaceous, limey dolomite grainstone. This dolomite had a trace of intercrystalline porosity with a trace of sample show. Interbedded with in this dolomite were cream to gray to tan, dense limestone packstone with no visible porosity or sample show. The lower portion of the Lower Ismay from 5532' to the top of the Gothic at 5549' measured depth became increasingly argillaceous and darker in color, as the limestones and very thin dolomites graded into the shale of the Gothic Shale. This portion of the section was predominately tan to cream to light gray, dense to argillaceous limestones and very thin brown to medium brown, very argillaceous to marly dolomites. These limestones and dolomites were mainly microcrystalline to cryptocrystalline, earthy to slightly silty, as well as being slightly anhydritic with scattered tan to brown chert. Thin interbeds of carbonaceous shales were noted. Minor traces of fossils of indeterminate character were also present.

The Gothic Shale was penetrated at a measured depth of 5549', 5493' true vertical depth, and was the typical lithology, predominantly dark brown to black to dark gray shale, carbonaceous, silty, calcareous to slightly dolomitic and slightly micaceous. The top of the Gothic was picked primarily by a significant decrease in the penetration rate as well as an increase in the amount of shale in the samples. The top underlies the Lower Ismay with a gradational contact and overlays the Desert Creek with a rather sharp contact.

The top of the Desert Creek member of the Upper Paradox formation was marked by a thin transition zone facies between the overlying Gothic Shale and the underlying 1-A porosity zone. This thin interval, in this northwesterly direction had a true thickness of approximately 5'. The lithology of the transition zone in this lateral, displayed the typical transition zone facies of interbedded light gray to white to brown, cryptocrystalline to microcrystalline limestone, argillaceous to clean, rare crinoid fossils and dense, with thin streaks of medium brown to brown dolomite, microcrystalline with a argillaceous to limey matrix, thin dark gray to black, carbonaceous shale partings and very thin anhydrite streaks to scattered crystals. This zone displayed no visible porosity with no visible staining, spotty very poor dull mineral fluorescence and no visible cut.

The top of the Desert Creek 1-A porosity zone was encountered at a measured depth of 5602', true vertical depth of 5510', approximately flat to the top of the 1-A zone on the R.U. 17-21 vertical well log. The top was noted by a significant increase in the penetration rate and a change to the typical oolitic limestone grainstone displaying oomoldic and intercrystalline porosity development. The limestones in the northwesterly 1-A porosity zone were tan to brown, some cream, very fine to microcrystalline, with a noticeable amount of granular to microsucrosic texture, oolitic to oomoldic and a slightly anhydritic to dolomitic cement. These limestone grainstones have a fair to good oolitic and intercrystalline porosity development, fair brown stain to traces of black bituminous stain*, a good bright to occasionally dull yellow fluorescence and fair to good streaming to some slow diffused cuts. Thin interbeds of slightly oolitic limestone packstones were present though out the 1-A porosity zone and were cream to tan in color, microcrystalline with a dense tight to slightly chalky texture. The limestone packstones had no visible sample shows and were occasionally anhydritic. The 1-A porosity zone was projected to be about 9 feet thick in this northwesterly lateral, based on the 1-A zone thickness seen in Lateral Leg #1. The vertical well log showed the 1-A zone to be approximately 13' thick and was expected to thin as the lateral moved away from the vertical well bore. The 1-A zone, in this northwest lateral, was encountered at a horizontal displacement of 143', and was interpreted to be thinner than the 13 foot thick porosity zone seen on the gamma neutron log from the vertical well.

The curve portion of the lateral was completed at a measured depth of 5643', 5513.7' true vertical depth, and a horizontal displacement of 188', with an inclination of 89.9 degrees, on April 26, 1998. As mentioned earlier due to the length of the lateral, the lateral was able to be continued with no trip to change bottom hole assemblies.

As the lateral was continued in the good oolitic to oomoldic limestone grainstones of the 1-A porosity zone, the formation slowly pushed the well path downward as the well bore was rotated ahead. The base of the 1-A porosity zone was not encountered through out the drilling of the lateral. The top of the 1-A zone was "bumped" at measured depths of 5990' and 6293', with true vertical depths of 5516.5' and 5522', at horizontal displacements of 533' and 837' respectively, as the well bore followed the best porosity downward, with an inclination of approximately 89 degrees. The top of the 1-A horizon appeared to level off at a true vertical depth of 5521 to 5520', before slowly trending upward at a measured depth of 6430', with a horizontal displacement of 974'. As the well path was slowly continued upward at a very shallow angle the top 1-A porosity zone was again bumped at a measured depth of 6560', 5519.5' and a horizontal displacement to 1104'. At this point the well path was again slowly pushed downward, as the well path was

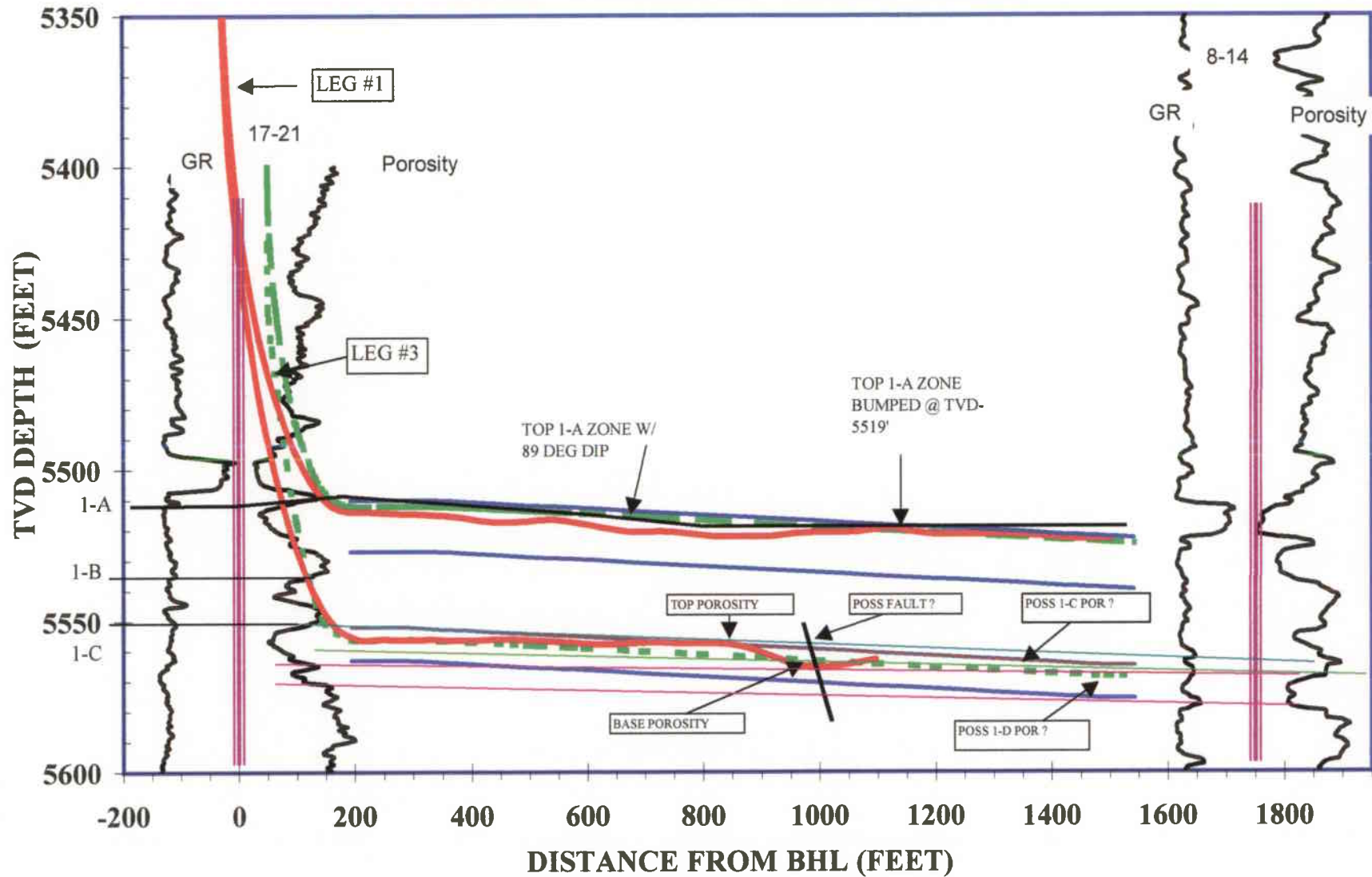
continued to its termination at a measured depth of 6959', 5522.7' true vertical depth and a horizontal displacement of 1503'.

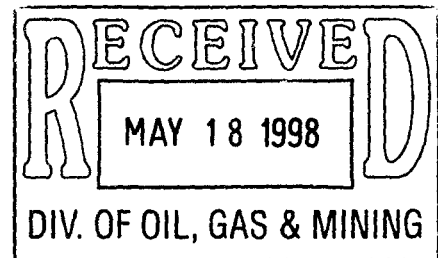
Throughout the lateral section through the 1-A porosity zone, the lithology remained in the good tan to cream to brown, cryptocrystalline to very finely crystalline, oolitic to oomoldic limestone grainstones, which had minor anhydrite crystals and some anhydritic to dolomitic cement. When the top was encountered a slight increase in white to cream, some tan, occasionally oolitic, slightly chalky to platy limestone packstone, with rare silty streaks was noted. These packstones showed a decrease in sample shows, and had very thin streaks of porosity, as the packstones were only very shallowly penetrated. The good oolitic to oomoldic limestone grainstones showed predominately good sample shows, with scattered intervals of decreased sample shows, as the top of the zone was approached. Also noted was very minor flushed zones were noted along the well path, until nearing the end of the lateral when a significant decrease in the amount of fluorescence, stain and cut was noted, indicating an increase in possible flushing of the zone, as the porosity remained good.

From the beginning of the lateral section to termination on April 27, 1998, at a measured depth of 6959', 5522.7 true vertical depth and a horizontal displacement of 1503.7', the lithology remained consistent. With the exception of minor increases in dense limestone packstones as the top of the 1-A porosity zone was encountered, the lithology of the zone remained quite consistent in the good oolitic to oomoldic limestone grainstones described above, with minor chert fragments and scattered anhydrite filled porosities. The sample shows remained predominately good, with only minor variations as indicated above. In tracking the well path through the 1-A in the limestone grainstone porosity is well developed enough to enhance the overall performance of the zone when returning the well to water flood.

*The black residual staining has been called by Dr. Dave Eby & others as "bitchimum" and is also known as "dead oil" ("dd o stn" on mud logs). This staining is associated with the movement of oil over long periods of time and is a good indicator of producible hydrocarbons when associated with productive porosities, but can also be found in porosities that have been filled by anhydrites and other material at later dates.

MOBIL, Ratherford Unit #17-21, Northwest Laterals





MOBIL

**RATHERFORD UNIT #17-21
SE HORIZONTAL LATERAL LEG #4
1-A POROSITY BENCH
DESERT CREEK MEMBER
PARADOX FORMATION
SECTION 17, T41S, R24E
SAN JUAN, UTAH**

**GEOLOGY REPORT
by
DAVE MEADE
ROCKY MOUNTAIN GEO-ENGINEERING CORP.
GRAND JUNCTION, COLORADO
(970) 243-3044**

MICROFILM

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WELL SUMMARY

OPERATOR:	MOBIL EXPLORATION & PRODUCTION U.S. INC.
NAME:	RATHERFORD UNIT #17-21 SE HORIZONTAL LATERAL LEG #4 IN THE DESERT CREEK 1-A POROSITY BENCH
LOCATION:	SECTION 17, T41S, R24E
COUNTY/STATE:	SAN JUAN, UTAH
ELEVATION:	KB:4751' GL:4739'
SPUD DATE:	4/18/98
COMPLETION DATE:	5/03/98
DRILLING ENGINEER:	BENNY BRIGGS / SIMON BARRERA
WELLSITE GEOLOGY:	DAVE MEADE
MUDLOGGING ENGINEERS:	DAVE MEADE / LUKE TITUS
CONTRACTOR:	BIG "A" RIG 25
TOOLPUSHER:	J. DEES
HOLE SIZE:	4 3/4"
CASING RECORD:	SIDETRACK IN WINDOW AT 5302' MEASURED DEPTH
DRILLING MUD:	M-I DRILLING FLUIDS
ENGINEER:	RON WESTENBERG
MUD TYPE:	FRESH WATER & BRINE WATER W/ POLYMER SWEEPS
DIRECTIONAL DRILLING CO:	SPERRY-SUN
ELECTICAL LOGGING:	NA
TOTAL DEPTH:	6915' MEASURED DEPTH; TRUE VERTICAL DEPTH-5522.4'
STATUS:	TOH & LAY DOWN TOOLS - PREPARE WELL FOR RIG MOVE TO R.U. 17-22 LOCATION

DRILLING CHRONOLOGY
RATHERFORD UNIT #17-21
SE 1-A HORIZONTAL LATERAL LEG #4

DATE	DEPTH	DAILY	ACTIVITY
4/28/98	6959'	2'	CIR SWEEP & SPLS-PUMP 11 BBL BRINE-TOH TO WINDOW-DISPLACE HOLE W/BRINE-CUT 60' DRLG LINE-TOH-L.D. LATERAL ASSEM-P. U. RETRIEVING HOOK-WORK ON BLOCKS-TIH-CIR BTMS UP THRU CHOKE-W.O. BLOCKS-RESTRING NEW BLOCKS-DISPLACE HOLE W/BRINE-LATCH INTO WHIPSTOCK #3-TOH-PICK UP WHIPSTOCK #4 & STARTER MILL-ORIENT-TIH-SET WHIPSTOCK-CIR BTMS UP-MILL W/STARTER MILL 5294' TO 5296'-L.D. 2 JTS PIPE-TOH
4/29/98	5296'	34'	TOH-L.D. STARTER MILL-PICK UP WINDOW & WATERMELLON MILLS-TIH-CIR-MILL 5294' TO 5302'-PUMP 10 BBL SWEEP& CIR OUT-DISPLACE HOLE W/BRINE-L.D 66 JTS AOH-TOH-L.D. MILLS-PICK UP & ORIENT DIR DRLG ASSEMBLY-TEST MWD & MUD MOTOR-TIH-CIR HOLE THRU CHOKE--TIH-CIR BTMS UP THRU CHOKE--RIG UP GYRO DATA-RUN GYRO-TIME DRLG 5302' TO 5302'-DIR DRLG W/WIRE LINE SURVEYS
4/30/98	5330'	130'	DIR DRLG W/WIRE LINE SURVEYS TO 5343'-PULL GYRO & RIG DOWN GYRO DATA-DIR DRLG & SURVEYS TO 5439'-PUMP 10 BBL BRINE-L.D. 6 JTS PIPE-DISPLACE HOLE W/BRINE-TOH-CHANGE OUT MUD MOTOR-TIH-CIR BTMS UP THRU CHOKE-DIR DRLG & SURVEYS
5/01/98	5460'	148'	DIR DRLG & SURVEYS
5/02/98	5608'	813'	DIR DRLG & SURVEYS
5/03/98	6421'/ 6915' TD	494'	DIR DRLG & SURVEYS TO 6915' (MUD MOTOR FAILED & WELL TD'D)-PUMP 10 BBL SWEEP & CIR SPLS-DISPLACE HOLE W/BRINE WATER-L.D. 2 JTS PIPE-TOH TO WINDOW-DISPLACE W/ BRINE-TOH-L.D. DIR ASSEM.-P. U. RETRIEVING HOOK-TIH-LATCH INTO WHIPSTOCK-SHEAR OFF-TOH & PREPARE WELL FOR RIG MOVE
5/04/98	6915'	TD	

DAILY ACTIVITY

Operator: MOBIL

Well Name: RATHERFORD UNIT #17-21 SE 1-A HORIZONTAL LATERAL LEG #4

DATE	DEPTH	DAILY	DATE	DEPTH	DAILY
4/28/98	6959'	2'			
4/29/98	5296'	34'			
4/30/98	5330'	130'			
5/01/98	5460'	148'			
5/02/98	5608'	813'			
5/03/98	6421'	494'			
5/03/98	6915'	TD			

BIT RECORD

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #17-21 SE 1-A HORIZONTAL LATERAL LEG #4

RUN	SIZE	MAKE	TYPE	IN/OUT	FTG	HRS	FT/HR
1	4 3/4"	STC	MF-37P	5302'/ 6915'	1613'	77.5	20.8

MUD REPORT

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #17-21 SE 1-A HORIZONTAL LATERAL LEG #4

DATE	DEPTH	WT	VIS	PLS	YLD	GEL	PH	WL	CK	CHL	CA	SD	OIL	WTR
4/28/98	5523'	9.0	26	2	1	0/0	11.0	NC	NC	80K	4600	1	2%	97%
4/29/98	5302'	9.2	26	2	1	0/0	11.0	NC	NC	94K	4000	1	0%	99%
4/30/98	5414'	9.0	26	1	1	0/0	11.0	NC	NC	74K	3800	2	4%	94%
5/01/98	5501'	8.7	27	2	1	0/0	12.0	NC	NC	70K	3800	3	8%	89%
5/02/98	5752'	8.7	27	2	1	0/0	12.0	NC	NC	68K	3400	2	6%	92%
5/03/98	6718'	8.8	26	1	1	0/0	10.0	NC	NC	55K	3200	2	4%	94%

SPERRY-SUN DRILLING SERVICES
SURVEY DATA

Customer ... : Mobil (Utah)
Platform ... : RATHERFOED UNIT
Slot/Well .. : BA25/17-21, 4A1

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	TVD	NORTHINGS FEET	EASTINGS FEET	VERTICAL SECTION	DOG LEG
5100.00	0.22	187.95	5099.80	14.98 S	27.65 E	31.01	0.00
5294.00	0.18	152.81	5293.80	15.62 S	27.74 E	31.48	0.07
5302.00	2.60	128.00	5301.80	15.74 S	27.89 E	31.67	30.47
5322.00	7.20	128.20	5321.72	16.30 S	29.23 E	33.38	23.00
5342.00	12.10	128.40	5341.43	18.38 S	31.86 E	36.73	24.50
5362.00	17.10	128.60	5360.78	22.02 S	35.80 E	41.77	25.00
5382.00	22.70	128.80	5379.57	26.27 S	41.11 E	48.57	28.00
5402.00	29.20	129.00	5397.55	31.77 S	47.92 E	57.32	32.50
5422.00	35.60	126.90	5414.43	38.34 S	56.38 E	68.03	32.49
5442.00	41.70	126.80	5430.04	45.33 S	66.37 E	80.51	30.50
5462.00	47.60	127.90	5444.26	54.35 S	77.53 E	94.56	29.75
5482.00	53.50	128.80	5456.96	63.94 S	89.63 E	109.99	29.70
5502.00	59.20	129.30	5468.04	74.42 S	102.56 E	126.63	28.58
5522.00	63.10	128.30	5477.69	85.39 S	116.21 E	144.15	19.99
5542.00	65.90	129.00	5486.30	96.57 S	130.30 E	162.19	14.35
5562.00	70.90	129.10	5493.66	108.38 S	144.74 E	180.78	25.00
5582.00	73.50	129.30	5499.77	120.41 S	159.49 E	199.82	13.03
5602.00	76.40	129.20	5504.97	132.63 S	174.45 E	219.13	14.51
5622.00	79.10	131.40	5509.21	145.27 S	189.35 E	238.65	17.26
5642.00	83.20	132.10	5512.29	158.43 S	204.09 E	258.37	20.79
5666.00	87.10	131.20	5514.32	174.32 S	221.96 E	282.23	16.67
5698.00	89.30	130.20	5515.32	195.18 S	246.20 E	314.17	7.55
5729.00	91.10	126.60	5515.21	214.43 S	270.49 E	345.17	12.98
5761.00	93.10	125.90	5514.04	233.33 S	296.28 E	377.13	6.62
5793.00	91.80	128.00	5512.67	252.55 S	321.33 E	409.09	7.71
5825.00	91.00	127.70	5511.89	272.18 S	347.09 E	441.08	2.67
5856.00	89.60	126.80	5511.73	290.94 S	371.76 E	472.08	5.37
5888.00	90.40	126.80	5511.73	310.11 S	397.39 E	504.07	2.50
5920.00	90.40	127.30	5511.50	329.39 S	422.93 E	536.06	1.56
5952.00	86.40	128.00	5512.40	348.93 S	448.25 E	568.04	12.69
5984.00	87.30	129.30	5514.16	368.88 S	473.20 E	599.99	4.94
6015.00	90.80	130.50	5514.67	388.76 S	496.97 E	630.97	11.94
6047.00	90.40	130.30	5514.33	409.50 S	521.34 E	662.94	1.40
6079.00	90.60	130.30	5514.06	430.20 S	545.75 E	694.91	0.62
6111.00	86.80	128.40	5514.78	450.48 S	570.48 E	726.88	13.28
6143.00	86.70	126.80	5516.60	469.97 S	595.79 E	758.83	5.00
6174.00	87.00	126.50	5518.30	488.45 S	620.62 E	789.78	1.37
6205.00	87.10	125.90	5519.89	506.73 S	645.61 E	820.72	1.96

SPERRY-SUN DRILLING SERVICES
SURVEY DATA

Customer ... : Mobil (Utah)
Platform ... : RATEERFOED UNIT
Slot/Well .. : BA25/17-21, 4A1

MEASURED DEPTH	ANGLE DEG	DIRECTION DEG	TVD	NORTEINGS FEET	EASTINGS FEET	VERTICAL SECTION	DOG LEG
6237.00	86.10	125.10	5521.79	525.28 S	671.61 E	852.63	4.00
6269.00	87.50	126.30	5523.58	543.92 S	697.56 E	884.56	5.76
6301.00	88.20	127.20	5524.78	563.06 S	723.18 E	916.52	3.56
6333.00	88.40	127.70	5525.73	582.51 S	748.57 E	948.51	1.68
6364.00	89.20	127.20	5526.38	601.35 S	773.18 E	979.50	3.04
6396.00	89.10	126.10	5526.85	620.45 S	798.85 E	1011.49	3.45
6428.00	93.20	127.00	5526.21	639.50 S	824.54 E	1043.46	13.12
6460.00	91.20	126.10	5524.98	658.54 S	850.23 E	1075.43	6.85
6491.00	89.70	127.30	5524.74	677.07 S	875.08 E	1106.42	6.20
6523.00	90.60	127.50	5524.65	696.50 S	900.50 E	1138.42	2.88
6555.00	90.60	128.70	5524.32	716.25 S	925.68 E	1170.41	3.75
6586.00	89.70	129.30	5524.24	735.75 S	949.77 E	1201.41	3.49
6618.00	91.10	129.30	5524.01	756.02 S	974.54 E	1233.40	4.38
6650.00	89.60	129.10	5523.82	776.24 S	999.33 E	1265.39	4.73
6682.00	91.10	129.10	5523.62	796.43 S	1024.17 E	1297.38	4.69
6713.00	90.40	128.70	5523.22	815.89 S	1048.29 E	1328.37	2.60
6744.00	88.70	128.40	5523.46	835.21 S	1072.53 E	1359.37	5.57
6776.00	89.50	128.40	5523.96	855.08 S	1097.61 E	1391.37	2.50
6808.00	90.40	128.20	5523.99	874.92 S	1122.72 E	1423.37	2.88
6840.00	91.30	127.90	5523.52	894.64 S	1147.91 E	1455.36	2.96
6871.00	90.70	127.30	5522.98	913.55 S	1172.47 E	1486.36	2.74
* 6915.00	90.70	127.30	5522.44	940.21 S	1207.47 E	1530.35	0.00 *

THE DOGLEG SEVERITY IS IN DEGREES PER 100.00 FEET.
N/E COORDINATE VALUES GIVEN RELATIVE TO WELL HEAD.
TVD COORDINATE VALUES GIVEN RELATIVE TO WELL HEAD.
THE VERTICAL SECTION ORIGIN IS WELL HEAD.
THE VERTICAL SECTION WAS COMPUTED ALONG 128.00 (TRUE).
CALCULATION METHOD: MINIMUM CURVATURE.

* 6915 PROJECTED TO BIT AT T.D. 5100 GYRO TIE-ON
5294 INTERPOLATED GYRO, 5302-5382 INTERPOLATED AZI
5402 AZI HAS MAG.INTERFERENCE, 5302 AZI IS GYRO TF.

SAMPLE DESCRIPTIONS

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #17-21 SE 1-A HORIZONTAL LATERAL LEG #4

DEPTH	LITHOLOGY
5302.00 5310.00	"LS crm-wh-ltgy-ltbrn-gybrn,crpxl-micxl,rthy-chk,occ cln-dns,v sl anhy,occ chty,mrly-shy,occ grdg to v lmy MRLST,dol ip,v rr mic fos,tt,NFSOC,w/tr intbd SH gy-gybrn sbblky dol-calc mica rthy v sl slty rr Crin fos & scat CMT frag-ool LS cvgs"
5310.00 5320.00	"LS tan-ltbrn-crm,occ brn,crpxl,occ micxl-sl slty,dns,mrly ip,v sl dol-anhy,chtty,tt,NFSOC,w/scat SH & CHT AA"
5320.00 5330.00	"LS AA,pred dns,tt,sl mrly,NFSOC,v rr ANHY incl,v rr mbrn micxl rthy DOL mrly ip dns tt NFSOC,scat bf-brn CHT frag"
5330.00 5340.00	"LS crm-ltbrn-brn,occ ltgy,crpxl-micxl,dns,dol ip,v sl anhy,mrly,tt,NFSOC,tr ltbrn-bf CHT frgs,scat SH ltbrn-gybrn,sbblky,lmy,dol,mica,rthy,v sl slty,v rr dns brn micxl dns rthy DOL frag,n vis POR,NFSOC"
5340.00 5350.00	"LS AA,bcmg incr mrly-dol & shly,tt,NFSOC,v rr thn v mrly mbrn-gybrn micxl rthy DOL tt,NFSOC,tr CHT frag,bcmg pred brn-gybrn-gy lmy-dol SH"
5350.00 5360.00	"SH lt-mgybrn-ltgy,sbblky-sbplty,rthy,sl slty,mica,calc-dol,occ mrly,w/thn gybrn micxl rthy mrly sl lmy DOL incl,bcmg tan-brn-crm crpxl-micxl LS cln-rthy sl slty anhy w/bf-brn tan CHT frag"
5360.00 5370.00	"LS crm-tan-gy-brn,crpxl-micxl,occ cln,dns,AA,w/v thn mbrn-brn crpxl dns DOL lams-vrr lt-dkgy,gybrn,occ blk SH AA occ carb,tr CHT frag AA"
5370.00 5380.00	"LS AA,incr slty-anhy,w/thn scat ANHY stks,tt,NFSOC,rr thn brn dns DOL frag & tr SH AA"
5380.00 5390.00	"LS wh-crm,tan-ltbrn,crpxl-micxl,rthy-chk,dns,anhy-tr ANHY stks,dol,slty-v slty ip,tt,NFSOC,v rr thn dns rthy DOL stks-rr thn dkgybrn arg-lmy-sl dol SH lams-tr CHT frag"
5390.00 5400.00	"LS crm-tan-brn,crpxl-micxl,rr vfxl,gran w/abnt ANHY fl POR,rthy-chk ip,rr mic fos-fos hash-v sl alg,w/v rr intxl-alg POR,rr spty bri yel FLOR,n-v rr fnt brn STN,rr slow-mod fast CUT,tr smky gybrn-brn CHT frag,v rr thn v lmy dns-v sl rthy DOL stks-NFSOC"
5400.00 5410.00	"LS tan-brn-crm,occ wh,AA,v anhy-pred ANHY fl POR,n-v rr mic fos,n-v rr spty intxl POR,v rr spty bri yel FLOR,n vis STN-CUT,w/abnt CHT AA,v rr thn carb SH lams-v rr arg DOL frag"
5410.00 5430.00	"LS crm-tan-brn,rr wh,crpxl-micxl,v sl gran,rr mic fos,pred dns-rthy-chk PKST,v chty w/gy-brn bf CHT frag,v rr scat arg DOL frag-blk carb SH lams,rr spty ANHY fl intxl POR,n-v rr spty FLOR,n vis STN-CUT"

DEPTH	LITHOLOGY
5430.00 5440.00	"LS AA,incr mbrn-mrly sl dol,v chty,dns,tt,FOR-STN-CUT AA,w/scat thn DOL-SH & decr CHT frag"
5440.00 5455.00	"LS,bn-ltbn-crm-tn,mic-vfxl,rthy-arg,mdns,scat crm-dns PCKST,rr foss frgs,rr calc frac flg,tr bf-ltbn CHT frgs,chlky;pred rthy to intrxl fab POR,vsptty dul yelgld FLOR,noCUT,p-blk-dkbrn OSTN"
5455.00 5470.00	"LS AA,ltbn-brn-crm,mdns,sne crm mic-vf xln PCKST,scat offwht chlky carb mat,rthy,arg,POR AA,no CUT,FLOR AA,p-dkbrn-blk OSTN"
5470.00 5480.00	"LS crm-tan-brn,gybrn-mbrn,crpxl-micxl,v rr vfxl-gran,v rthy-chk,arg,rr fos,sl dol,anhy ip,mrly ip,tt-v rr intxl POR,NFSOC,w/scat thn intbd SH gybrn-brn,sbplty,mica,arg,slty ip,calc-dol,w/scat Crin fos,mrly ip,w/scat brn-smky gy CHT frag"
5480.00 5490.00	548"LS AA,incr arg-mrly,grdg to v lmy MRLST & SH,rr v thn brn micxl rthy-mrly DOL incl,bcmg brn-gybrn occ mgy-dkbrn sbblky-sbplty rthy arg mica sl slty calc-dol sl fos SH,v rr scat ltbrn-bf CHT frag"
5490.00 5510.00	"LS crm-tan-brn,ltgy,crpxl-micxl,v rr vfxl-gran,v rthy-chk,arg,occ slty,rr mic fos,sl dol,anhy ip,mrly ip,tt-v rr intxl POR,n-v rr mnrl FLOR,n STN-CUT,tr brn micxl rthy-arg tt DOL lams,w/v thn SH ptg AA,w/rr Crin fos,mrly ip,w/rr CHT frag"
5510.00 5530.00	"LS tan-ltbrn-crm,crpxl-micxl,vfxl-v slty ip,occ gran,sl rthy-arg,dns,v sl mica,tt-tr intxl POR,tr dull-bri yel FLOR,n-v rr vis STN,v p slow dif-v rr stmg CUT,tr ltbrn-brn CHT frag,v rr arg DOL incl,rr blk carb SH lams"
5530.00 5540.00	"LS crm-tan-brn,crpxl-micxl,AA,incr slty-dol,w/scat ANHY xl-incl,pred dns,v rr intxl POR,n vis FLOR-STN-CUT,v thn DOL incl AA,v rr SH ptgs AA,scat CHT frag"
5540.00 5550.00	"DOL brn-mbrn,micxl,occ vfxl-gran,sl micsuc,arg ip,occ rthy,sl lmy,rr ANHY xl-trnsl CHT frag,rr mic fos,v sl alg,tt-fr intxl-v rr alg POR,mg yel FLOR,g brn-rr blk STN,fr slow-mod fast stmg CUT,rr dns LS PKST frag"
5550.00 5560.00	"DOL AA,incr arg-lmy,POR-FLOR-STN-CUT AA,bcmg pred LS ltgy-gybrn-crm-tan,crpxl-micxl,rthy-sl arg,chk,sl dol,dns,tt,NFSOC,scat bf-trnsl CHT frag,v rr SH lams"
5560.00 5570.00	"LS AA,thn intbd brn-gybrn crpxl-micxl arg lmy occ mrly DOL tt w/NFSOC,grdg to blk-dkgy carb calc-dol SH"
5570.00 5580.00	"SH,dkbn-dkgybn-blk,arg,sbblky-sbplty,carbonaceous,sft-scat blk mfrm,tr tn DOL LS,rthy,tr micro pyr,sl slty,tr shly DOL"
5580.00 5590.00	"SH AA,decr in ARG DOL,decr in DOL LS,pred arg-carb SH,rthy,sl slty,sbblky-sbplty,tr mic-pyr"

DEPTH	LITHOLOGY
5590.00 5600.00	"SH AA,rr ltbrn PCKST,rr ARG DOL,rr calc frac flng,pred CARB SH,sl slty,blk sl fiss"
5600.00 5610.00	"SH AA,grdg to LS ltbn-bn-crm,crpxl-micxl,scat vfxl,pred PKST,rthy ip,sl arg,sl dol ip-dolo rich,scat chlky-sl anhy LS,rr foss frgs,sme anhy incl,sptty dkbrn-occ blk OSTN,pred intrxl fab POR,v-spty dul yelgld FLOR,no CUT"
5610.00 5620.00	"LS,ltgybn-ltbn-tn,occ crm,crpxl-micxl,scat vfxl,pred mdns-dns PKST,occ tt mtx,rthyip,rr calc frac flgs,tr blk-dkbrn CARB SHsme dkbrn DOL LS-arg/rthy-tt mtx;pred compact xln-p-interxln fab POR,dul-spty yelgld FLOR,no CUT,spty p-dkbn OSTN"
5620.00 5630.00	"LS,tn-ltbn,occ crpxl,pred mic-vf xln,mdns-dns mtx,pos intrclstic,pred PKST,sl anhy,sl rthy,dec in dkbn ARG DOL,POR AA,dul sptty yelgld FLOR,no-wk CUT"
5630.00 5650.00	"LS,ltbn-tn-occ crm,sl mot-mot,mic-vf xln,mdns mtx,scat sl suc-grn mtx,pred ool rich oom-occ GRNST,scat mdns sl ool PKST,rr chlky carb mat-offwht,tr foss frgs,pred intrxln to oom/occ fab POR,scat interool fab POR,pr-slo strm/ dif CUT,p-m o STN,tr SH CVGS"
5650.00 5660.00	"LS AA,ltbn-tn-crm,mot,mic-vf xln,mdns-oom to occ GRNST,chlky-dens sl ool PKST,ckly/calc fld casts,ool,sl foss;pred interxln to scat oom/occ fab POR,m-dkbn OSTN-cast fld blk OSTN res,mbri yelgld FLOR,p-slo strm/sl mlky ring CUT;flushed"
5660.00 5680.00	"LS,ltbrn-tn-crm,sl mot,mic-vf xl,sl suc mtx,pred mdns-sl ool PKST,scat oom-occ GRNST,rr calc frac flgs,rr SH prtgs,ool;pred interxln to scat oom/occ fab POR,slo strm/dif CUT,mbri-spty bri yelgld FLOR,dkbrn-spty blk OSTN"
5680.00 5690.00	"LS tan-crm-ltbrn,rr wh,crpxl-vfxl,occ gran-micsuc,intbd dns occ ool sl plty PKST & ooc-oom GRNST,occ anhy-dol cmt,rr ANHY xl-POR fl,v rr trnsf CHT frag,tt-fr intxl-ool POR,mfr dull-bri yel FLOR,tr-fr brn STN,v rr blk dd o STN,tr-fr slow-mod fast CUT"
5690.00 5720.00	"LS tan-ltbrn-crm,rr wh,crpxl-vfxl,occ gran-micsuc,pred ooc-oom GRNST,w/thn intbd sl ool-dns PKST,tr ANHY-DOL cmt,v rr ANHY xl-POR fl,scat trnsf-bf CHT frag,tt-mg intxl-ool POR,fr dull-bri yel FLOR,fr brn STN-rr blk dd o STN,fr-mg slow-mod fast stmg CUT"
5720.00 5740.00	"LS AA,pred ooc-oom GRNST,decr sl ool dns occ arg-plty PKST,fr-g ool-fr intxl POR,fr dull-bri yel FLOR,fr ltbrn-brn STN,tr blk dd o STN,fr-mg slow-mod fast-tr fast stmg CUT"
5740.00 5760.00	"LS AA,w/sl incr chk-plty occ v sl arg ool PKST frag,pred ooc-oom GRNST,fr-mg intxl-fr ool POR,fr-mg bri-fr dull yel FLOR,fr brn-blk STN,fr-mg mod fast-fast stmg CUT"

DEPTH	LITHOLOGY
5760.00 5770.00	"LS tan-brn,rr cr m-wh,crpxl-vfxl,occ gran-micsuc,pred ooc-oom GRNST,w/thn intbd chk-plty dns PKST,occ anhy-dol cmt,rr ANHY xl-POR fl,v rr trns1 CHT frag,fr-mg intxl-ool POR,fr dull-bri yel FLOR,fr ltbrn-brn STN,tr blk dd o STN,mfr-fr slow-fast CUT"
5770.00 5790.00	"LS tan-ltbrn-crm,rr wh,crpxl-vfxl,occ gran-micsuc,pred ooc-oom GRNST,tr thn sl ool-dns occ chk-plty PKST,rr DOL cmt,v rr ANHY xl-POR fl,v rr bf CHT frag,tt-mg intxl-ool POR,fr-g bri-dull yel FLOR,fr brn STN-rr blk dd o STN,fr-mg slow-mod fast stmg CUT"
5790.00 5810.00	"LS AA,pred ooc-oom GRNST w/scat dns sl ool PKST incl,fr-g ool-fr intxl POR,fr-mg dull-bri yel FLOR,fr-mg brn-dkbrn STN,rr-tr blk dd o STN,fr-g mod fast-fast stmg mlky CUT"
5810.00 5830.00	"LS AA,w/incr bf-crm,rr wh,chk-plty occ v sl arg sl anhy occ ool PKST,pred ooc-oom GRNST,tt-mg intxl-fr ool POR,n-mg bri-fr dull yel FLOR,n-fr brn-blk STN,n-mg mod fast-fast stmg CUT"
5829.00 5850.00	"LS tan-brn,rr crm-wh,micxl-vfxl,occ gran-micsuc,pred ooc-oom GRNST,w/v rr chk-plty crpxl sl ool PKST,occ DOL cmt,sl anhy-rr ANHY xl-POR fl,v rr trns1 CHT frag,mg ool-fr intxl POR,mg bri-dull yel FLOR,fr ltbrn-brn STN,rr blk dd o STN,fr-mg slow-fast CUT"
5850.00 5880.00	"LS AA,pred ooc-oom GRNST w/scat dns sl ool PKST incl,fr-g ool-fr intxl POR,fr-mg dull-bri yel FLOR,fr-mg brn-dkbrn STN,rr-tr blk dd o STN,fr-g mod fast-fast stmg mlky CUT"
5880.00 5910.00	"LS tan-crm-ltbrn,rr wh,crpxl-vfxl,occ gran-micsuc,intbd ooc-oom GRNST & dns crpxl occ plty-chk sl ool PKST,occ DOL cmt,rr ANHY xl-POR fl,v rr bf CHT frag,tt-fr intxl-ool POR,fr dull-bri yel FLOR,tr brn STN-v rr blk dd o STN,fr slow dif-tr mod fast CUT"
5910.00 5930.00	"LS AA,incr dns tan-bf,occ crm-wh v sl ool dns occ chk-plty anhy ip PKST,w/stks ooc-oom GRNST,tt-mfr intxl-tr ool POR,mfr-fr dull-tr bri yel FLOR,tr-mfr ltbrn-rr brn STN,v rr spty blk dd o STN,fr slow dif-tr mod fast stmg CUT"
5930.00 5950.00	"LS tan-ltbrn,crm-wh ip,rr brn,crpxl-micxl,v rr vfxl-gran-micsuc,pred sl ool occ plty-chk sl anhy dns PKST,rr-tr intbd ooc-oom GRNST,tr trns1-bf CHT frag,sl dol,v rr-tr ANHY xl-POR fl,tt-mfr intxl-tr ool POR,mfr dull-bri yel FLOR,tr brn STN,n-fr slow CUT"
5950.00 5960.00	"LS tan-crm-ltbrn,rr wh,crpxl-vfxl,occ gran-micsuc,pred ooc-oom GRNST,w/thn crpxl occ plty-chk sl ool PKST frag,sl DOL cmt,rr ANHY xl-POR fl,rr bf CHT frag,tr-mg intxl-ool POR,fr-mg dull-bri yel FLOR,tr brn STN-rr blk dd o STN,fr mod fast-tr slow CUT"
5960.00 5980.00	"LS pred ooc-oom GRNST AA,rr scat PKST & CHT frag AA,fr-mg intxl-fr ool POR,mg dull-bri yel FLOR,fr ltbrn-brn STN,rr-tr blk dd o STN,fr-g mod fast-fast stmg CUT"

DEPTH	LITHOLOGY
5980.00 6000.00	"LS tan-crm-ltbrn,rr wh,cr pxl-vfxl,occ gran-micsuc,pred ooc-oom GRNST,w/thn crpxl occ plty-chk sl ool PKST frag,sl DOL cmt,rr ANHY xl-POR fl,rr bf CHT frag,tr-mg intxl-ool POR,fr-mg dull-bri yel FLOR,tr brn STN-rr blk dd o STN,fr mod fast-tr slow CUT"
6000.00 6020.00	"LS pred micxl-vfxl ooc-oom GRNT,w/scat thn crpxl sl ool dns occ anhy chk-plty ip PKST,tr-mg ool-fr intxl POR,fr-mg bri-dull yel FLOR,fr lt-mbrn STN-rr spty blk dd o STN,fr-mg slow-mod fast-tr fast stmg CUT"
6020.00 6040.00	"LS,ltbrn-tn,occ crm,sl mot-mot,mic-vf xln,sl suc-occ grn mtx,pred mdns-sl ool PCKST to scat ooc-oom GRNST,sl anhy;pred f-ool unterxln to scat oom-ooc fab POR,mbri-bri yelgld FLOR,fr-ltbn-bn OSTN,sptty blk OSTN,m-slo strm/dif strmg CUT"
6040.00 6060.00	"LS pred micxl-vfxl ooc-oom GRNT,w/scat thn crpxl sl ool dns occ anhy chk-plty ip PKST,tr-mg ool-fr intxl POR,fr-mg bri-dull yel FLOR,fr lt-mbrn STN-rr spty blk dd o STN,fr-mg slow-mod fast-tr fast stmg CUT"
6060.00 6080.00	"LS,ltbn-tn-crm,mot,mic-vfxl,scat cprxl,sl ool-w/sme interool-mdns PCKST,oom-ooc-occ sl suc GRNST,sl dolo,sme calc/chlky fld casts;pred f-interxln to scat oom-ooc fab POR,dkbrn-ltbrn OSTN,sptty blk OSTN,m-slo-fst strm/dif CUT,mbri-bri yelgld FLOR"
6080.00 6100.00	"LS,ltbn-tn-crm,sl mot-mot,mic-vf xln,pred sl ool-chlky-dns PKST to sl suc-oom/ooc GRNST,sl anhy,rr sh frgs,sme calc cast flgs;pred f-ool interxln fab POR w/sme oom/ooc fab POR,sptty cast fld blk OSTN,dkbrn-brn OSTN,mbri-bri yelgld FLOR,m-slo strm/dif CUT"
6100.00 6120.00	"LS,ltbn-tn-crm,sl mot-mot,mic-vf xln,pred sl ool-chlky-dns PKST to sl suc-oom/ooc GRNST,sl anhy,rr sh frgs,sme calc cast flgs;pred f-ool interxln fab POR w/sme oom/ooc fab POR,sptty cast fld blk OSTN,dkbrn-brn OSTN,mbri-bri yelgld FLOR,m-slo strm/dif CUT"
6120.00 6140.00	"LS,ltbrn-tn,occ crm,sl mot-mot,mic-vf xln,dns-sl ool PCKST,sl grn-sl suc scat oom/ooc GRNST,sl anhy,sl chlky,rr frac flgs,sl foss;pred f-intxl to scat oom/ooc fab POR,mbri-bri yelgld FLOR,slo strm/milky ring/CUT,dkbrn-brn OSTN,sptty blk OSTN res"
6140.00 6160.00	"LS,ltbrn-tn,occ crm,sl mot-mot,mic-vf xln,dns-sl ool PCKST,sl grn-sl suc scat oom/ooc GRNST,sl anhy,sl chlky,rr frac flgs,sl foss;pred f-intxl to scat oom/ooc fab POR,mbri-bri yelgld FLOR,slo strm/milky ring/CUT,dkbrn-brn OSTN,sptty blk OSTN res"
6160.00 6180.00	"LS,ltbrn-tn-occ crm,sl mot-mot,mic-pred vf xl,pred vf xl-ool GRNST,tr dns PCKST,ool,rr foss frgs,rr calc frac flgs,scat chlky carb mat;pred f-interxln to v-scat oom/ooc fab POR,f-sl dif strm CUT,mbri-sptty bri yelgld FLOR,dkbrn-sptty blk OSTN res"

DEPTH	LITHOLOGY
6180.00 6200.00	"LS,ltbrn-tn,occ crm,sl mot,mic-pred vf xln,pred sl suc-ool-occ oom GRNST,rr dns-sl ool PCKST,sl chlky,sl anhy,rr calc frac flgs;pred f-interxln to v-scat oom fab POR,dkbrn-sptty blk OSTN res,mbri-bri yelgld FLOR,m-slo-fst strm/dif CUT"
6200.00 6220.00	"LS,ltbrn-tn-occ crm,sl mot-mot,mic-pred vf xl,pred vf xl-ool GRNST,tr dns PCKST,ool,rr foss frgs,rr calc frac flgs,scat chlky carb mat;pred f-interxln to v-scat oom/ooc fab POR,f-sl dif strm CUT,mbri-sptty bri yelgld FLOR,dkbrn-sptty blk OSTN res"
6220.00 6240.00	"LS,ltbrn-tn-occ crm,sl mot-mot,mic-pred vf xl,pred sl suc-ool GRNST,rr dns sl ool PKST,ool,rr foss frgs,rr calc frac flgs,scat chlky carb mat;pred f-interxln to v-scat oom/ooc fab POR,f-sl dif strm CUT,mbri-sptty bri yelgld FLOR,dkbrn-sptty blk OSTN res"
6240.00 6260.00	"LS,ltbrn-tn,occ crm,sl mot,mic-pred vf xln,pred sl suc-sl grn GRNST,rr dns-sl ool PCKST,sl chlky,sl anhy,rr calc frac flgs;pred f-interxln to micropore v-scat oom fab POR,dkbrn-sptty blk OSTN res,mbri-bri yelgld FLOR,m-slo-fst strm/dif CUT"
6260.00 6280.00	"LS,ltbn-tn,occ crm,mot,mic-vf xln,sl suc-occ grn-mdns mtx,pred ool GRNST-v-scat oom/ooc GRNST,rr dns PKST,sme calc frac flgs,tr clalc/chlky cast flgs;pred f-interxln to micropore /micromoldic fab POR,dkbrn-brn OSTN,sptty blk OSTN,mbri-bri yelgld FLORMCUT"
6280.00 6300.00	"LS,ltbrn-tn,occ crm,sl mot,mic-pred vf xln,pred sl suc-sl grn GRNST,rr dns-sl ool PCKST,sl chlky,sl anhy,rr calc frac flgs;pred f-interxln to micropore v-scat oom fab POR,dkbrn-sptty blk OSTN res,mbri-bri yelgld FLOR,m-slo-fst strm/dif CUT"
6300.00 6320.00	"LS,ltbrn-tn-occ crm,sl mot-mot,mic-pred vf xl,pred sl suc-ool GRNST,rr dns sl ool PKST,ool,rr foss frgs,rr calc frac flgs,scat chlky carb mat;pred f-interxln to v-scat oom/ooc fab POR,f-sl dif strm CUT,mbri-sptty bri yelgld FLOR,dkbrn-sptty blk OSTN res"
6320.00 6340.00	"LS,ltbrn-tn,occ crm,sl mot,mic-pred vf xln,pred sl suc-ool-occ oom GRNST,rr dns-sl ool PCKST,sl chlky,sl anhy,rr calc frac flgs;pred f-interxln to v-scat oom fab POR,dkbrn-sptty blk OSTN res,mbri-bri yelgld FLOR,m-slo-fst strm/dif CUT"
6340.00 6360.00	"LS,ltbrn-tn-occ crm,mot,mic-vf xln,ool-occ oom/occ sl suc GRNST,tr foss frgs,scat ,mdns-dns PCKST,sl rthy,rr chlky-sl anhy-sl ool PKST;pred f-interxln to micropore w/sme oom to ooc fab POR,mf-dkbrn-blk OSTN,mbri-bri yelgl FLOR,m fst-slo/dif CUT"
6360.00 6380.00	"LS,tn-ltbrn-crm,mot-scat sl mot,mic-pred vf xln,pred ool-scat oom/ooc mdns GRNST,sme chlky/calc fld casts,tr anhy xls;pred f-interxln to oom/occ fab POR,blk cast fld OSTN,dkbrn-brn OSTN,mbri-bri yelgld FLOR,mf-slo strm/fst dif CUT"

DEPTH	LITHOLOGY
6380.00 6400.00	"LS,ltbrn-tn,occ crm,sl mot,mic-pred vf xln,p red sl suc-ool-occ oom GRNST,rr dns-sl ool PCKST,sl chky,sl anhy,rr calc frac flgs;pred f-interxln to v-scat oom fab POR,dkbrn-sptty blk OSTN res,mbri-bri yelgld FLOR,m-slo-fst strm/dif CUT"
6400.00 6420.00	"LS,ltbrn-tn-occ crm,sl mot-mot,mic-vf xln,pred ool-oom/ooc-intrxl-occ mdns GRNST,rr dns PCKST,ool,sl foss,rr calc frac flgs,sl rthy,rr anhy;pred f-interxln to oom/ooc fab POR,dkbrn-ltbrn OSTN,cast fld blk OSTN res,mbri-bri yelgld FLOR,slo-fst dif strmCUT"
6420.00 6440.00	"LS,tn-ltbrn-crm,mot-scat sl mot,mic-pred vf xln,pred ool-scat oom/ooc mdns GRNST,sme chky/calc fld casts,tr anhy xls;pred f-interxln to oom/occ fab POR,blk cast fld OSTN,dkbrn-brn OSTN,mbri-bri yelgld FLOR,mf-slo strm/fst dif CUT"
6440.00 6460.00	"LS,ltbrn-tn-occ crm,sl mot-mot,mic-pred vf xl,pred sl suc-ool GRNST,rr dns sl ool PKST,ool,rr calc frac flgs,scat chky carb mat;pred f-interxln to v-scat oom/ooc fab POR,rr interool,mf-sl dif strm CUT,mbri-sptty bri yelgld FLOR,dkbrn-sptty blk OSTN res"
6460.00 6480.00	"LS,ltbrn-tn,occ crm,sl mot-mot,mic-vf xln,dns-sl ool PCKST,sme oom/ooc GRNST,sl anhy,sl chky,rr frac flgs,sl foss;pred f-intxl to v-scat oom/ooc fab POR,mbri-bri yelgld FLOR,slo strm/milky ring/CUT,dkbrn-brn OSTN,sptty blk OSTN res"
6480.00 6500.00	"LS,ltbrn-tn,occ crm,sl mot-mot,mic-vf xln,dns-sl ool PCKST,sme oom/ooc GRNST,sl anhy,sl chky,rr frac flgs,sl foss;pred f-intxl to v-scat oom/ooc fab POR,mbri-bri yelgld FLOR,slo strm/milky ring/CUT,dkbrn-brn OSTN,sptty blk OSTN res"
6500.00 6520.00	"LS,tn-crm,occ ltbn,mott,mic-vf xln,occ grn-sl suc mtx,pred ool w/sme intrxln to oom/occ-ool GRNST,rr dkbn sl ool dns PCKST,sme cast flgs,rr chky carb mat,pred mf-f interxln fab POR to oom/ooc fab POR,dkbn-ltbn OSTN,sptty blk OSTN res,mbri-bri yelgldFLOR"
6520.00 6540.00	"LS,tn-crm-ltbn,mott,mic-vf xln,occ grn-sl suc mtx,pred ool-oom/occ-ool GRNST,rr dkbn sl ool-dns PCKST,rr calc frac flgs,sl foss,rr chky carb mat,pred mf-f interxln fab POR to oom/ooc fab POR,dkbn-ltbn OSTN,sptty blk OSTN res,mbri-bri yelgld FLOR,slo CUT"
6540.00 6560.00	"LS,ltbrn-tn-crm,mot,mic-vf xln,mdns-sl grn mtx,pred ool-oom/ooc mdns intrxl GRNST,rr PKST,rr calc frac flgs,sme calc/chky/anhy flgs;pred mf-f intrxln to oom/occ w/sme scat interool fab POR,sptty blk cast fld OSTN res,dkbrn-ltbrn OSTN,mbri-bri yelgldFLOR"
6560.00 6580.00	"LS tan-ltbrn,rr crm-ltgy,crpxl-micxl,occ vfxl-gran,v sl micsuc,pred ooc-oom GRNST,w/thn dns sl anhy-occ ool PKST,tr ANHY xl,rr trnsl CHT,occ DOL cmt,fr-mg ool-tr intxl POR,tr-fr dull-bri yel FLOR,mfr ltbrn-brn STN,rr blk dd o STN,tr-fr slow-mod fast CUT"
6580.00 6600.00	"LS pred ooc-oom GRNST,scat thn intbd dns sl ool occ chk PKST,rr trnsl-clr CHT frag,tr ANHY xl-incl-v rr POR fl,tr-fr dull-bri yel FLOR,mfr ltbrn-brn STN-v rr blk dd o STN,fr mod fast-slow-rr fast stmg CUT"

DEPTH	LITHOLOGY
6600.00 6620.00	"LS tan-ltbrn,occ brn,pred ooc-oom GRNST,w/scat sl ool dns anhy PKST AA,fr ool-tr intxl POR,mfr dull-tr bri yel FLOR,mfr-fr ltbrn-tr brn STN-rr spty blk dd o STN,mfr-fr slow-tr fast stmg CUT"
6620.00 6640.00	"LS AA,w/v rr scat trns1 CHT frag-tr ANHY xl,POR-FLOR-STN-CUT AA"
6640.00 6660.00	"LS tan-ltbrn,rr crm-ltgy,crpxl-micxl,occ vfxl-gran,v sl micsuc,pred ooc-oom GRNST,w/thn dns sl anhy-occ ool PKST,tr ANHY xl,rr trns1 CHT,occ DOL cmt,fr-mg ool-tr intxl POR,tr-fr dull-bri yel FLOR,mfr ltbrn-brn STN,rr blk dd o STN,tr-fr slow-mod fast CUT"
6660.00 6680.00	"LS AA,sl incr ool dns v sl ool PKST incl,fr ool-tr intxl POR,fr dull-tr bri yel FLOR,mfr ltbrn-brn STN-rr blk dd o STN,fr slow-tr mod fast-fast stmg CUT"
6680.00 6700.00	"LS pred ooc-oom GRNST,rr-tr PKST AA,fr-g intxl-mfr ool POR,fr ltbrn-rr brn-v rr spty blk STN,fr mod fast-fast-tr slow stmg CUT"
6700.00 6710.00	"LS tan-ltbrn,rr crm-ltgy,crpxl-micxl,occ vfxl-gran,v sl micsuc,pred ooc-oom GRNST,incr dns sl anhy-occ ool PKST,tr ANHY xl,rr trns1 CHT,occ DOL cmt,fr-mg ool-tr intxl POR,tr-fr dull-bri yel FLOR,mfr ltbrn-brn STN,rr blk dd o STN,tr-fr slow-mod fast CUT"
6710.00 6740.00	"LS AA,sl incr ool dns v sl ool PKST incl,bcmg pred ooc-oom GRNST w/depth,fr ool-intxl POR,fr-mg dull-tr bri yel FLOR,fr ltbrn-brn STN-tr blk dd o STN,fr-mg slow-fr mod fast-fast stmg CUT"
6740.00 6750.00	"LS pred ooc-oom GRNST,rr-tr PKST AA,v rr scat trns1-crl CHT frag,fr intxl-ool POR,fr-mg bri yel FLOR,fr ltbrn-brn-tr spty blk STN,fr-mg slow-fr mod fast-fast stmg mlky CUT"
6750.00 6760.00	"LS pred tan-ltbrn,rr brn-crm,crpxl-vfxl,occ sl gran-micsuc,sl ooc-oom GRNST,w/scat dns sl ool anhy PKST,v rr CHT frag,rr ANHY xl-incl,DOL cmt ip,fr intxl-ool POR,fr dull-bri yel FLOR,mfr ltbrn STN-tr blk dd o STN,mg slow stmg-mfr mod fast-fast CUT"
6760.00 6790.00	"LS pred sl ooc-oom GRNST AA,scat PKST AA,incr fr-mg intxl-fr ool POR,fr-mg dull-bri yel FLOR,tr-mfr ltbrn-rr brn STN-tr blk dd o STN,mfr-mg slow-fast stmg CUT"
6790.00 6810.00	"LS pred ooc-oom GRNST,rr-tr PKST AA,mg intxl-fr ool POR,mfr-fr dull-bri yel FLOR,mfr ltbrn-rr brn STN-tr spty blk STN,fr mod fast-fast-tr slow stmg CUT"
6810.00 6830.00	"LS pred tan-ltbrn,rr brn-crm,crpxl-micxl,occ vfxl-micsuc,sl ooc-oom GRNST,w/scat dns sl ool anhy PKST,n-rr CHT frag,rr ANHY xl-incl,DOL cmt ip,fr ool-tr vis intxl POR,fr dull-bri yel FLOR,mfr ltbrn STN-tr blk dd o STN,mg slow stmg-fr mod fast-fast CUT"

DEPTH	LITHOLOGY
6830.00 6850.00	"LS pred sl ooc-oom GRNST AA, scat PKST AA, incr fr-mg intxl-fr oo l POR, fr-mg dull-bri yel FLOR, tr-mfr ltbrn-rr brn STN-tr blk dd o STN, mfr-mg slow-fast stmg CUT"
6850.00 6870.00	"LS pred ooc-oom GRNST AA, w/scat tr sl ool dns occ anhy PKST, fr intxl-ool POR, mg bri-tr dull yel FLOR, fr ltbrn-brn STN-mfr blk dd o STN, fr-g mod fast-fast stmg mlky CUT"
6870.00 6900.00	"LS tan-ltbrn, v rr crm-brn, crpxl-vfxl, gran-micsuc ip, pred ooc-oom GRNST, tr scat dns sl ool PKST, rr scat ANHY xl, v sl dol, rr bf CHT frag, fr intxl-ool POR, mg bri yel FLOR, fr ltbrn-brn-tr blk STN, mg mod fast-fast stmg CUT"
6900.00 6915.00	"LS tan-ltbrn, rr brn-crm-ltgy, micxl-vfxl, occ crpxl, pred ooc-oom GRNST AA, w/scat tr sl ool dns occ anhy PKST, rr bf CHT frag, scat ANHY xl, fr-mg intxl-ool POR, mg bri-tr dull yel FLOR, fr ltbrn-brn STN-mfr blk dd o STN, fr-g mod fast-fast stmg mlky CUT"

FORMATION TOPS

OPERATOR: MOBIL

WELL NAME: RATHERFORD UNIT #17-21 SE 1-A HORIZONTAL LATERAL LEG #4

[illegible]

GEOLOGICAL SUMMARY

AND

ZONES OF INTEREST

The Mobil Exploration and Production U.S., Inc., Ratherford Unit #17-21 Southeast Horizontal Lateral Leg #4 was a re-entry of the Mobil Ratherford Unit #17-21 located in Section 17, T41S, R24E, and was sidetracked in a southeasterly direction from 5302' measured depth, 5302' true vertical depth, on April 28, 1998. The lateral reached a measured depth of 6915', true vertical depth of 5522.4' at total depth, with a horizontal displacement of 1530' and true vertical plane 127 degrees on May 3, 1998 in the Desert Creek 1-A porosity zone. During the initial preparation of the well bore, difficulty was experienced setting the oriented packer due to bad casing. The packer was finally set at 5349' instead of 5456' as originally planned. This necessitated setting the whipstock for lateral #4 about 100 feet higher than called for in the drilling plan, resulting in a curve radius of 313 feet.

Due to the radius of the curve, the lateral could be drilled without a change of directional bottom hole assemblies. During the curve section of the hole, a trip was made at a measured depth of 5439', 55428' true vertical depth, on April 30, 1998, when the mud motor failed. The curve portion of the lateral was completed at a true vertical depth of 5515', near the base of the upper 1-A porosity zone of the Desert Creek on May 2, 1998. Because the lateral was started higher than anticipated, the curve section of the hole was begun in the lower portion of the Honaker Trail Formation of the Hermosa Group before encountering the typical section of Upper Ismay, Lower Ismay, Gothic Shale and Desert Creek members of the Upper Paradox Formation.

Objectives of the Ratherford Unit #17-21 leg #4 horizontal lateral were to penetrate and drill the 1-A porosity horizon, to identify and define the lithology, and evaluate the porosity and effective permeability of the 1-A bench of the Desert Creek. These objectives were accomplished in the 1-A zone, which had a consistent lithology through the length penetrated, and showed only minor variations in lithology. After completing the curve section of the lateral, the lateral section required minor amounts of sliding to try to control vertical depth and horizontal plane direction. The well path used the proposed target line through out the 1-A zone as a reference point. Both the top and bottom of the porosity were encountered with in the 1-A zone. The lateral section of the hole was terminated 70 feet premature due to the mud motor failing.

The basal 56 feet of the Honaker Trail Limestone was penetrated when the drilling of lateral leg #4 was begun just under the whipstock. The lithology was predominately a dense limestone packstone, which was tan to brown, light gray to gray brown to cream, microcrystalline to cryptocrystalline with an earthy to slightly chalky texture, occasionally argillaceous, cherty, occasionally grading to very limey marlstone. Interbedded with in the limestones were light gray to brown gray, calcareous to dolomitic, silty and micaceous shales; medium gray brown to brown, argillaceous to very slightly marly dolomites and scattered chert fragments. The zone exhibited no to very rare visible porosity, with no visible fluorescence, stain or cut. The basal shale marker at the Honaker Trail lime to Upper Ismay contact was represented by a light to dark gray to gray brown shale, slightly silty to micaceous, calcareous to slightly dolomitic, occasionally carbonaceous, with very thin argillaceous, marly limestone and dolomite streaks.

The top of the Upper Ismay was encountered at a measured depth of 5359', true vertical depth of 5358'. The Upper Ismay formation, from 5359' to 5380' measured depth was characterized by interbedded clean to argillaceous limestone and limey argillaceous dolomite. The limestone was tan to cream to gray and occasionally brown, microcrystalline to cryptocrystalline, clean to earthy, argillaceous, some chalky to slightly silty, with rare anhydrite inoculations to streaks. Common light tan to brown and occasional dark brown cherts were present plus scattered crystalline calcite and anhydrite. The argillaceous dolomites were predominately gray brown in color with a more argillaceous to silty texture, cryptocrystalline to microcrystalline, grading to a dolomitic marlstone in part. Of interest in the Upper Ismay was the thin interbedded slightly calcareous, very argillaceous to shaley dolomite seen in the interval a measured depth of 5380' through 5409'. These thin interbedded dolomites were brown to gray brown, microcrystalline with a microsucrosic texture and displaying very poor intercrystalline porosity, with scattered anhydrite crystals. These thin dolomites within the Upper Ismay displayed a very poor sample show with very poor intercrystalline porosity development. The limestones of this interval were white to cream, tan to light brown, cryptocrystalline to microcrystalline, occasionally very fine crystalline and granular streaks. The limestones were very slightly algal, earthy to clean, dense, some dolomitic cement, and had scattered anhydrite inclusions and scattered traces of brown to smokey gray brown chert fragments and dark gray brown to black carbonaceous shale laminations to partings. These limes had thin streaks of intercrystalline to rare algal porosity, and rare spotty fluorescence, stain and cut. The base of the Upper Ismay from a measured depth of 5409' to the top of the Lower Ismay at a measured depth of 5493', was a light brown to brown, cream to white and occasionally light gray brown limestone. The limestone was predominately cryptocrystalline to microcrystalline, dense, with some chalky to very slightly silty streaks. The zone was also slightly anhydritic and had traces of micro fossil fragments and crinoidal fossil fragments, there were also scattered tan to brown chert and scattered black shale laminae. This zone displayed slight intercrystalline porosity development with very spotty fluorescence, rare stain and a very poor slow diffuse cut. The Hovenweep marker between the Upper and Lower Ismay members was very poorly represented in the samples in this lateral. A minor increase in gray brown to dark gray, calcareous to slightly dolomitic, very slightly carbonaceous shales was noted in the samples from a measured depth of 5585' to 5593'.

The top of the Lower Ismay was picked at a measured depth of 5493', 5463' true vertical depth, based primarily on sample identification and a slight increase in rate of penetration. The lithology of the Lower Ismay from 5493' to 5540' measured depth was predominately limestone, cream to brown and occasionally light gray brown in color, very fine crystalline to microcrystalline to cryptocrystalline in part, predominately dense and argillaceous with thin chalky to silty streaks. This interval had traces of tan to brown chert, was slightly anhydritic and had scattered black carbonaceous shale laminations. The interval displayed very poorly developed intercrystalline to earthy type porosity in part with only very rare poor sample shows at best. A brown to medium brown, microcrystalline dolomite with minor very finely crystalline to granular streaks, was noted from a measured depth of 5540' to 5559'. This dolomite was very slightly algal, and had scattered light colored chert fragments and traces of anhydrite crystals, with scattered dense limestone inclusions. The porosity seen was fair to moderately good intercrystalline to very slightly algal, with a fair to good sample show. The lower portion of the Lower Ismay from 5559' to the top of the Gothic at 5567' measured depth became more argillaceous and darker in color. This portion of the section was predominately a limestone, brown to light brown to tan to cream and occasionally light gray to white in color. The texture was mainly microcrystalline to cryptocrystalline, earthy to slightly chalky with thin interbedded slightly marly, medium gray brown dolomite partings and was slightly anhydritic with scattered crystalline anhydrite and scattered tan to brown chert. Thin interbeds of calcareous sandstone were observed near the base of the section. Only rare spotty intercrystalline porosity was observed with no visible staining, fluorescence or cut.

The Gothic Shale was penetrated at a measured depth of 5567', 5494' true vertical depth. The shales (sappropelic dolomites) were the typical lithology; predominantly dark brown to black to dark gray black shale, carbonaceous, silty, soft to slightly firm, subblocky to some platy, calcareous to slightly dolomitic and slightly micaceous, with very rare micro pyrite crystals. The top of the Gothic was picked primarily by an increase in penetration rate. The top was represented by only a minor amount of shale in the samples.

The top of the Desert Creek member of the Upper Paradox formation was picked at a measured depth of 5610', 5506' true vertical depth. The top was picked on the increase in carbonate rocks in the samples as well as a change in the rate of penetration. The transition zone between the Gothic Shale and the 1-A zone of the Desert Creek was marked by a thin transition zone facies between the overlying Gothic Shale and the underlying 1-A porosity zone. This thin interval in this lateral was a facies of predominately light gray brown to light brown to tan, cryptocrystalline to microcrystalline, dense limestone, which were clean to argillaceous, very slightly silty, anhydritic to slightly dolomite. Interbedded in the limestones were dark brown to brown, microcrystalline to cryptocrystalline, dense, argillaceous to marly dolomites and thin black carbonaceous shales. This zone displayed no to a very poorly developed intercrystalline porosity with no visible staining, spotty very poor dull mineral fluorescence and no visible cut.

The top of the Desert Creek 1-A porosity zone was encountered at a measured depth of 5629', true vertical depth of 5510', approximately flat to the top of the 1-A zone on the R.U. 17-21 vertical well log. The top was noted by a significant increase in the penetration rate and a change to the oolitic to oomoldic limestone grainstones typical of the 1-A zone in this area. The limestone grainstones in the northwesterly 1-A porosity zone were tan to brown, some cream, very fine crystalline to microcrystalline, with a granular to microsucrosic texture, slightly anhydritic, with a dolomitic cement. These limestone grainstones have a fair oolitic to moderately good intercrystalline porosity development, fair brown stain to traces of black bitchimum stain*, a fair bright to occasionally dull yellow fluorescence and fair to good streaming to some slow diffused cuts. Thin interbeds of slightly oolitic limestone packstones were present though out the 1-A porosity zone and were cream to tan in color, cryptocrystalline, some microcrystalline, with some slightly chalky texture, but predominately dense to clean and very slightly anhydrite. The limestone packstones had no visible porosity and no visible sample shows. The 1-A porosity zone was projected to be about 9 feet thick in this southeasterly lateral, based on the 1-A zone thickness seen in Lateral Leg #1. The vertical well log showed the 1-A zone to be approximately 13' thick and was expected to thin as the lateral moved away from the vertical well bore. The top 1-A zone, in this southeast lateral, was encountered at a horizontal displacement of approximately 245', and was seen to be significantly thinner than the 13 foot thick porosity zone seen on the gamma neutron log from the vertical well, and was closer to 5 foot thick.

The curve portion of the lateral was completed at a measured depth of 5698', 5515.3' true vertical depth, and a horizontal displacement of 314.18', with an inclination of 89.3 degrees, on May 2, 1998. As mentioned earlier due to the length of the lateral, the lateral could be continued with no trip to change bottom hole assemblies. Just prior to completing the curve portion of Lateral Leg #4, the base of the 1-A zone was bumped at a true vertical depth of 5515', 296' horizontal displacement with a measured depth of 5680'. The 1-A zone at this point was determined to be approximately 5' thick.

As the lateral was continued at a shallow upward angle in the good oolitic to oomoldic limestone grainstones of the 1-A porosity zone, the top of the zone was encountered at a measured depth of 5820', 5512' true vertical depth, and a horizontal displacement of 436'. At this time the well path was "leveled" of at a true vertical depth of 5512' to 5512.5'. The top of the 1-A zone was "bumped" at a measured depth of 5897' and at a horizontal displacement of 513'. At this time the well path was oriented downward at a shallow angle to move away from the top of the zone. The top of the 1-A was shallowly penetrated from 5911' measured depth, 5512' true vertical depth, and

a horizontal displacement of 527'. This interval had a lithology of interbedded fair oolitic to oomoldic limestone grainstones and dense, slightly oolitic packstones. As the well bore moved slowly downward the top of the best porosity was acquired at a measured depth of 5953', 5512.5' true vertical depth, and a horizontal displacement of 569'. With the 1-A porosity thinning to a thickness of 2.5', the base of the porosity zone was again encountered at a measured depth of 6035', 5515' true vertical depth, and a horizontal displacement of 650'. As the well bore followed the best porosity, the well was allowed drift slowly downward, with an inclination of approximately 87.5 degrees. The well path was rotated ahead, and was allowed to slowly drift downward, until reaching a measured depth of 6418', 5527' true vertical depth and a horizontal displacement to 1133', when the base of the 1-A zone was bumped as the porosity zone thickened. At this point the well path was pushed upward in the oolitic to oomoldic limestone grainstones. The well path was continued upward to a measured depth of 6710', 5523' true vertical depth and a horizontal displacement of 1325', when the top of the thicker 1-A porosity zone was approached. Lateral leg #4 was terminated at a measured depth of 6915', 5522.4' true vertical depth, with a horizontal displacement of 1530', at or very near the top of the 1-A zone, 70' short of the proposed 1600' of displacement, when the mud motor failed.

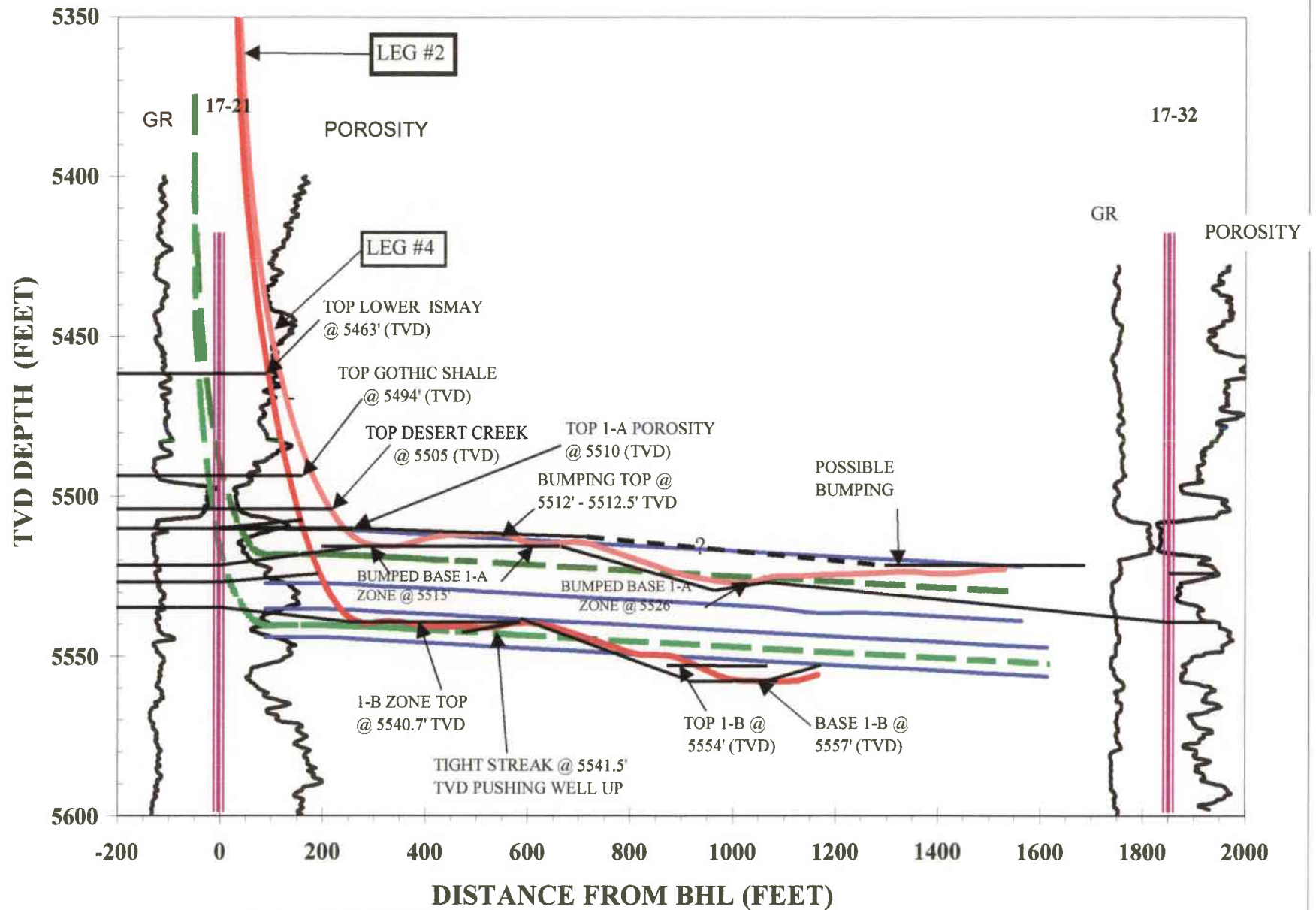
Through out the lateral section through the 1-A porosity zone, the lithology was predominately the good tan to cream to brown, cryptocrystalline to very finely crystalline, oolitic to oomoldic limestone grainstones, which had minor anhydrite crystals and some anhydritic to dolomitic cement. When the top and base of the zone was encountered a slight increase in white to cream, some tan, occasionally oolitic, slightly chalky to platy limestone packstone, with rare silty streaks was noted. These packstones showed a decrease in sample shows, and had very thin streaks of porosity, when the packstones at the top of the zone were very shallowly penetrated. The good oolitic to oomoldic limestone grainstones showed predominately fair good sample shows, with scattered intervals of decreased sample shows, as the top of the zone was approached or very shallowly penetrated and also when the base of the zone was encountered. Of note was an interval from a measured depth of 6100' to 6500' in which the lithology became predominately a limestone grainstone, with only minor amounts of oolitic to oomoldic porosity.

Beginning at a measured depth of 6400', an increase in the previously very minor water flow was noted. This water flow increased as the lateral was continued to termination. The oolitic limestone grainstone porosity showed a decrease in the overall sample show with in the good porosity. The sample show varied in quality with the amount of flushing created by the water flow. Also the back ground gases decreased with the increasing water flow beginning at 6400' and finally stabilizing at a measured depth of 6660' at 6000 to 7500 units. As the well path neared the end of the lateral, a slight increase in the amount and quality of the porosity and sample show increased slightly.

From the beginning of the lateral section to its termination on May 3, 1998, at a measured depth of 6915', 5522.4 true vertical depth and a horizontal displacement of 1530.4', the lithology remained rather consistent. With the exception of minor increases in dense limestone packstones as the top or base of the 1-A porosity zone was encountered, the lithology of the zone remained predominately in the good oolitic to oomoldic limestone grainstones described above, with minor chert fragments and scattered anhydrite filled porosities. The sample shows remained predominately good, with only minor variations as indicated above. In tracking the well path through the 1-A in the limestone grainstone porosity is well developed enough to enhance the overall performance of the zone when returning the well to water flood.

*The black residual staining has been called by Dr. Dave Eby & others as "bitchimum" and is also known as "dead oil" ("dd o strn" on mud logs). This staining is associated with the movement of oil over long periods of time and is a good indicator of producible hydrocarbons when associated with productive porosities, but can also be found in porosities that have been filled by anhydrites and other material at later dates.

MOBIL, Ratherford #17-21, Southeast Laterals



UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUBMIT IN DUPLICATE

(See other in-
structions on
reverse side)FORM APPROVED
OMB NO. 1004-0137
Expires: February 28, 1995

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

1a. TYPE OF WELL: OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> DRY <input type="checkbox"/> Other <input checked="" type="checkbox"/> INJECTOR		5. LEASE DESIGNATION AND SERIAL NO. 14-20-603-353					
b. TYPE OF COMPLETION: NEW WELL <input type="checkbox"/> WORK OVER <input type="checkbox"/> DEEP-EN <input type="checkbox"/> PLUG BACK <input type="checkbox"/> DIFF. RESVR. <input type="checkbox"/> Other <input checked="" type="checkbox"/> SIDETRACK		6. IF INDIAN, ALLOTTEE OR TRIBE NAME NAVAJO TRIBAL					
2. NAME OF OPERATOR MOBIL PRODUCING TX & NM INC.* *MOBIL EXPLORATION & PRODUCING US INC. AS AGENT FOR MPTM		7. UNIT AGREEMENT NAME RATHERFORD UNIT					
3. ADDRESS AND TELEPHONE NO. P.O. Box 633, Midland TX 79702 (915) 688-2585		8. FARM OR LEASE NAME, WELL NO. RATHERFORD 17-W-21					
4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)* At surface 510' FNL & 1830' FWL At top prod. interval reported below *#37 At total depth *#37		9. API WELL NO. 43-037-16416					
14. PERMIT NO. DATE ISSUED 1958 ORIGINAL		10. FIELD AND POOL, OR WILDCAT GREATER ANETH					
11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA SEC. 17, T41S, R24E		12. COUNTY OR PARISH SAN JUAN					
13. STATE UT		15. DATE SPUDDED 3-31-98					
16. DATE T.D. REACHED 5-04-98		17. DATE COMPL. (Ready to prod.) 6-04-98					
18. ELEVATIONS (DP, RKB, RT, GR, ETC.)* 4739' GR, 4751' KB		19. ELEV. CASINGHEAD					
20. TOTAL DEPTH, MD & TVD ** #37		21. PLUG, BACK T.D., MD & TVD ** #37					
22. IF MULTIPLE COMPLEMENTS, HOW MANY*		23. INTERVALS DRILLED BY ROTARY TOOLS CABLE TOOLS					
24. PRODUCING INTERVAL(S), OF THIS COMPLETION - TOP, BOTTOM, NAME (MD AND TVD) **#37 DSCR		25. WAS DIRECTIONAL SURVEY MADE YES					
26. TYPE ELECTRIC AND OTHER LOGS RUN NO		27. WAS WELL CORED NO					
28. CASING RECORD (Report all strings set in well)							
CASING SIZE/GRADE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	TOP OF CEMENT, CEMENTING RECORD	AMOUNT PULLED		
13 3/8"	27.1#	171.5'	17 1/4"	175 SXS - SURFACE			
8 5/8"	24#	1525'	12 1/4"	298 SXS - SURFACE			
5 1/2"	17 & 15.5#	5729'	7 3/4"	232 SXS			
ORIGINAL	CASING	UNDISTURBED					
29. LINER RECORD				30. TUBING RECORD			
SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)	SIZE	DEPTH SET (MD)	PACKER SET (MD)
					2 7/8"	5687'	5197'
31. PERFORATION RECORD (Interval, size and number) 5512-26', 5538-44', 5552-70' ORIGINAL PERFS				32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.			
				DEPTH INTERVAL (MD)			
				AMOUNT AND KIND OF MATERIAL USED			
				5670-6915'			
				LAT #4A1. ACIDIZED W/17808 GALS			
				15% HCL ACID			
				5591-6960'			
				LAT #3A1. ACIDIZED W/13950 GALS			
				*** #37			
				15% HCL ACID			
33.* PRODUCTION							
DATE FIRST PRODUCTION 6-98		PRODUCTION METHOD (Flowing, gas lift, pumping - size and type of pump) INJECTING				WELL STATUS (Producing or shut-in) PRODUCING	
DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD	OIL - BBL.	GAS - MCF.	WATER - BBL.	GAS - OIL RATIO
						264	
FLOW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE	OIL - BBL.	GAS - MCF.	WATER - BBL.	OIL GRAVITY - API (CORR.)	
2400							
34. DISPOSITION OF GAS (Sold, used for fuel, vented, etc.)						TEST WITNESSED BY	
35. LIST OF ATTACHMENTS DIRECTIONAL SURVEY							
36. I hereby certify that the foregoing and attached information is complete and correct as determined from all available records							
SIGNED <i>Shirley Houchins</i>				TITLE SHIRLEY HOUCHINS/ENV & REG TECH		DATE 8-3-98	

*(See Instructions and Spaces for Additional Data on Reverse Side)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT -" for such proposals

SUBMIT IN TRIPLICATE

1. Type of Well

☐ Oil Well ☐ Gas Well ☒ Other

2. Name of Operator **MOBIL PRODUCING TX & NM INC.***
***MOBIL EXPLORATION & PRODUCING US INC. AS AGENT FOR MPTM**

3. Address and Telephone No.

P.O. Box 633, Midland TX 79702 (915) 688-2585

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

SEC. 17, T41S, R24E
510 FNL & 1830 FWL

5. Lease Designation and Serial No.

14-20-603-353

6. If Indian, Allottee or Tribe Name

NAVAJO TRIBAL

7. If Unit or CA, Agreement Designation

RATHERFORD UNIT

8. Well Name and No.

RATHERFORD 17-W-21

9. API Well No.

43-037-16416

10. Field and Pool, or exploratory Area

GREATER ANETH

11. County or Parish, State

SAN JUAN UT

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION

- ☒ Notice of Intent
☐ Subsequent Report
☐ Final Abandonment Notice

TYPE OF ACTION

- ☐ Abandonment
☐ Recompletion
☐ Plugging Back
☐ Casing Repair
☐ Altering Casing
☒ Other **SIDETRACK/INJECTOR**
☐ Change of Plans
☐ New Construction
☐ Non-Routine Fracturing
☐ Water Shut-Off
☐ Conversion to Injection
☐ Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

BHL:

LATERAL #1 / 902' NORTH & 756' WEST **F/SURFACE SPOT** (ZONE 1c/1d)
LATERAL #2 / 876' SOUTH & 770' EAST **F/SURFACE SPOT** (ZONE 1b)
LATERAL #3 / 907' NORTH & 1200' WEST **F/SURFACE SPOT** (ZONE 1a)
LATERAL #4 / 940' SOUTH & 1207' EAST **F/SURFACE SPOT** (ZONE 1a)

SEE ATTACHED (3-30-98 -- 6-04-98)

14. I hereby certify that the foregoing is true and correct

Signed

Shirley Houchins

Title **SHIRLEY HOUCHINS/ENV & REG TECH**

Date **8-3-98**

(This space for Federal or State office use)

Approved by

Title

Date

Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

* See Instruction on Reverse Side

DRILLED FOOTAGE CALCULATION FOR DIRECTIONAL AND HORIZONTAL WELLS

Unit, Well Name: Ratherford Unit, Well 17-W-21
API Well #: 43-037-16416
Well Completion: Horizontal, 4 Legs

First leg description: **Lateral #1**

Kick Off Point	MD	5333.00
Kick Off Point	TVD	5332.80
End of Leg	MD	6662.00
End of Leg	TVD	5565.16
	Footage drilled:	1329.00
Max. TVD Recorded		5565.16

Second leg description: **Lateral #2**

	KOP MD:	5324.00
	KOP TVD:	5323.80
	EOL MD:	6576.00
	EOL TVD:	5557.74
	Footage drilled:	1252.00
Max. TVD Recorded		5557.74

Third leg description: **Lateral #3**

	KOP MD:	5309.00
	KOP TVD:	5308.80
	EOL MD:	6959.78
	EOL TVD:	5522.88
	Footage drilled:	1650.78
Max. TVD Recorded		5522.88

Fourth leg description: **Lateral #4**

	KOP MD:	5294.00
	KOP TVD:	5293.80
	EOL MD:	6915.00
	EOL TVD:	5526.85
	Footage drilled:	1621.00
Max. TVD Recorded		5526.85

Total Footage Drilled (MD):	5852.78
Deepest point (TVD):	5565.16

ATTACHMENT - FORM 3160-5
 RATHERFORD UNIT - WELL #17-W-21
 14-20-603-353
 NAVAJO TRIBAL
 SAN JUAN, UTAH

03-30-98 MIRU NAVAJO WEST 36
 03-31-98 FLOW WELL TO TANK ATTEMPT TO DROP PSI & KWM
 04-01-98 6HR SITP =1350, RIG UP BASIN W/L TIH COLLAR LOCATOR BAD, WAIT ON
 REPLACEMENT. TIH W LOGGING TOOL, LOG TOP OF PKR @ 5380'. RIH DOWN W/L,
 LATCH ON TBG PULL TO 50M, SI & SDFN
 04-02-98 SITP =400# RIG UP BASIN W/L TIH-SHOOT 2 CIRC HOLES @ 5372' 10' ABOVE PKR @
 5382' TOH R/D W/L. PUMP 14# MUD TO CIRC HOLE. SI ANN PSI TO 750. TBG SLOWLY
 BUILDING SDFN
 04-03-98 SITP =1150# REMOVE W/H BOLTS, UNSET PKR, L/D TOP JT W W/H ATTACHED NU BOP.
 TOH W 2.875" DUOLINE TBG. RIG UP SCHLUMBERGER, G/R-CCL LOG 5552-5000' THEN
 TIH & SET GUIB RBP @ 5245', RIG DOWN W/L TIH W KILL STRING, SI & SDFN
 04-04-98 NDBOP & TBG HEAD. INSTALL TBG HEAD TEST TO 1000#, INSTALL FLANGE WITH
 VALVE SD TILL MONDAY.
 04-06-98 RIG DOWN UNIT & AUX EQUIPMENT, MOVE TANK OUT START WORK ON LOCATION
 FOR RIG.
 04-10-98 NOTIFIED JIM THOMPSON W/ STATE OF UTAH ABOUT MOVING ON 17-21. MOVE IN
 AND RIG UP NAVAJO RIG #25
 04-11-98 FINISH RU RIG #25. SINGLE JACK TESTED TO 2500 PSI HIGH AND 250 PSI LOW OK. PU
 AND TIH. TO TOP OF RBP @ 5245' RU POWER SWIVEL. RELEASE RBP. WELL DEAD.
 POOH W/RBP.
 04-12-98 ND. GRANT HEAD AND FLOW TEE. RU SCHLUMBERGER. RIH W/ GAUGE RING AND
 JUNK BASKET. SET DOWN @ 5410'. TIH W/4 3/4" CSG. AND WATERMELON MILL TO
 5380'. RU POWER SWIVEL. ROTATE AND PUMP WHILE GOING DOWNHOLE. PUMP
 ROTATE AND RECIPROCATATE MILLS FROM 5380-5506'. (TOP PERF. @ 5512) AND CIRC.
 HOLE CLEAN. HANG SWIVEL BACK AND POOH W/MILLS. RU SCHLUMBERGER TIH
 W/WL SET @ 5456' (TOP OF PKR.) POOH. RD. WL UNIT. NU GRANT HD. TIH W/ANCHOR
 LATCH, LATCH INTO PKR. @ 5456'. PKR. SLIDING DOWNHOLE. PULL OUT OF PKR.
 PUSH PKR. DOWNHOLE TO 5500' AND LEFT ON BTM. POOH W/LATCH ASSY. ND
 GRANT HD. RU LUBRICATOR. TIH W/REPLACEMENT TIW PKR.
 04-13-98 CONTINUE IN HOLE W/TIW PKR. AND WL SET PKR. @ 5349'. RDWL. NU GRANT HD.
 ANCHOR LATCH ASSY. TO 5340' RU GYRO. RIH. AND FOUND PKR. KEYWAY @ 46
 GTF AND SURVEY TO SURFACE. RD GYRO. SHEAR OUT OF PKR. AND POOH.
 04-13-98 PU AND RIH W/LATCH ASSY., WHIPSTOCK W/STARTER MILL ON AOHPD TO 5333'
 LATCH INTO TIW PKR. 5349'. MILL FROM 5333-5335' W/STARTER MILL. CHANGE OUT
 MILLS. TIH W/CSG. AND WATERMELON MILL. POWER SWIVEL MILL FROM 5333-
 5338'
 04-14-98 MILLED WINDOW FROM 5338-5339' & FORMATION TO 5440' PUMPED SWEEP & CIRC
 HOLE CLEAN POH & LD MILLS
 04-14-98 RIH W/ PH6 TBG, & 2.875" AOHPD RU GYRO DATA, RIH W/ GYRO, TIME DRILLED FROM
 5340-5343'. SLIDE DRILLED CURVE FROM 5340-5450' W/MWD
 04-15-98 SLIDE & ROTATE DRILLED CURVE 1 FROM 5450-5694' W/MWD
 04-16-98 DRILLING LATERAL 1A1. PUMPED SWEEP & CIRC HOLE CLEAN. POH & LD CURVE
 ASSEMBLY. RIH 2.875" AOHPD W/ LATERAL ASSY. SLIDE & ROTATE DRILLED
 LATERAL 1A1 FROM 5694-6250'

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04-17-98 SLIDE & ROTATE DRILLED LATERAL 1A1 FROM 6250-6662' TD, TD WELL @ 6662' MD, 92.1 ANGLE, 318 DIRECTION, 5558' TVD & 1176' VS PUMPED SWEEP & CIRC HOLE CLEAN.

04-18-98 PULLED MUD MOTOR TO WINDOW @ 5333'. WELL FLOWING DISPLACED HOLE W/ 10# BRINE & KILLED WELL RIH W/ SUPER HOOK, CAUGHT & POH W/ WHIPSTOCK

04-18-98 RIH W/ANCHOR LATCH ASSEMBLY, WEATHERFORD WHIPSTOCK STARTING MILL. AOHDP, LATCHED ANCHOR KEYWAY IN TIW PKR @ 5349' W/KEYWAY GTF @ 46 DEG, TOP OF WHIPSTOCK @ 5324' W/ FACE OF SLIDE @138' DEG. MILLED WINDOW FROM 5324-5326'. RIH W/ WINDOW & WATERMELLON MILLS ON SAME BHA.

04-19-98 CUT WINDOW FROM 5323-5330' FORMATION TO 5431', CIRC, CLEAN POH W/ MILLS

04-19-98 RIH W/ 2.875" AOHDP, RU GYRO DATA & RIH W/ GYRO, TIME DRILLED FROM 5331-5334'. SLIDE DRILLED W/ GYRO FROM 5334-5358' POH W/ GYRO SLIDE & ROTATE DRILLED CURVE 2A1 FROM 5358-5425'

04-20-98 SLIDE & ROTATE DRILLED CURVE 2A1 FROM 5425-5614'

04-21-98 SLIDE & ROTATE DRILLED CURVE 2A1 FROM 5614-5800' LANDED CURVE @ 5686' MD, 90 DEG ANGLE, 143 DIRECTION, 5539' TVD 278' VS

04-22-98 SLIDE & ROTATE DRILLED LATERAL 2A1 FROM 5800-6275'

04-23-98 SLIDE & ROTATE DRILLED LATERAL 2A1 FROM 6275-6576', TD, 5555' TVD

04-24-98 PUMPED SWEEP & CIRC HOLE CLEAN RIH W/ SUPERHOOK, CAUGHT & SHEARED WHIPSTOCK, DISPLACED HOLE W/ 10# BRINE, POH & LD WHIPSTOCK. FINAL REPORT FOR LATERAL 2A1

04-24-98 RIH W/ TIW ANCHOR LATCH ASSEMBLY, 5 1/2" WEATHERFORD WHIPSTOCK, STARTING MILL & 2.875" DP, LATCHED INTO PKR @ 5349' W/ KEYWAY @ 46 DEG GTF, SET TOP OF WHIPSTOCK @ 5309'. CUT WINDOW FROM 5309-5311 W/ STARTING MILL. POH W/ MILL RIH W/ WINDOW & WATERMELLON MILLS CUT WINDOW FROM 5309-5312'

04-25-98 CUT WINDOW FROM 5312-5315', FORMATION TO 5317' PUMPED SWEEP & CIRC HOLE CLEAN, POH & LD AOHDP, POH & LD MILLS

04-26-98 SLIDE DRILLED CURVE FROM 3A1 FROM 5383-5590'

04-27-98 SLIDE & ROTATE DRILLED CURVE & LATERAL 3A1 FROM 5590-6555', LANDED CURVE @ 5643' MD, 89.9 ANGLE, 308 DIRECTION, 5514' TVD, 187' VS

04-28-98 SLIDE/ROTATE DRILL AND SURVEYS FROM 6555' TO TD OF 6960'. 5522.69' TVD, LATERAL 3A1. PUMP AND CIRC. SWEEP. POOH TO WINDOW. DISPLACE HOLE W/10# BRINE. POOH AND LAY DOWN SPERRY SUN TOOLS. PU SUPERHOOK. TIH TO TOP OF WHIPSTOCK AND CIRC BTM. UP DISPLACE HOLE W/10# BRINE. LATCH WS AND START OUT OF HOLE.

04-29-98 TIH W/TIW ANCHOR LATCH ASSY, WHIPSTOCK, STARTING MILL AND DP AND LATCH INTO TIW PKR. @ 5349' W/KEYWAY @ 46 GTF. SET TOP OF WHIPSTOCK @ 5294.5' W/SLIDE @ 128 GTF. PU POWER SWIVEL. CUT WINDOW FROM 5294-5296'. TOOHLAY DOWN STARTER MILL. PU CSG. AND WATERMELON MILL. TIH. MILL CSG. WINDOW FROM 5295.51' TO 5301 PLUS 1' FORMATION TO 5302'. PUMP SWEEP AND CIRC. HOLE W/10# BRINE TO KILL WELL. TOOHLAYING DOWN. AOHDP AND MILLS. PREPARE TO PU CURVE BUILDING ASSY.

04-29-98 FINISH OUT OF HOLE W/WHIPSTOCK AND LAY DOWN SAME.

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04-30-98 TIH W/ CURVE AND LATERAL ASSY. PH-6 TBG. AND 2 7/8" AOHDP. CIRC. BTMS RU GYRO DATA. TIME DRILL FROM 5302-5304'. SLIDE DRILL FROM 5304-5344'. PULL GYRO AND RD WL. SLIDE DRILL FROM 5344-5440' (MTR. FAILURE)

05-01-98 FINISH OUT OF HOLE W/BHA (MTR. FAILURE) REPLACE MTR. TIH. CONTINUE TO DRILL CURVE SECTION FOR LAT. #4 FROM 5440-5545'

05-02-98 SLIDE/ROTATE AND SURVEYS FROM 5545'-[LANDED CURVE SECTION @ 5666' MD, 5514.32' TVD, SURVEY @ 5984' MD 5514.16' TVD, 599.99 VERTICAL SECTION]-6011'

05-03-98 SLIDE/ROTATE DRILL AND SURVEYS FROM 6011-6915'. PROJECTED SURVEYS @ TD OF 6915' MD, 90.70 ANGLE, 127.30 AZ., 5522.44' TVD, 1530.35' VERTICAL SECTION. HANG SWIVEL BACK. POOH INTO CSG.

05-04-98 KILL WELL. POOH LAYING DOWN BHA. TIH W/PKR. W/BLANKING PLUG. AND TAILPIPE. TAILPIPE @ 5670'. PKR. @ 5215' (TOP WINDOW @ 5294'. POOH LAYING DOWN ALL DRILLSTRING. ND. AND PREPARE TO MOVE ROTARY RIG. RDMO.

Completion:

05-16-98 MIRU NAVAJO WEST RIG #36. SI PRESSURE @ 10:00 WAS 0 PSI. ND WELL HEAD NU BOPE. RU FLOW LINES, RU LINES TO PUMP AND PIT. PU GUIBERSON ON/OFF TOOL AND PH-6 TBG. RIH TO 5215'. RU AND REC.V. CIRC. ON TOP OF GUIBERSON PKR. CIRC. CLEAN. RU AND TEST 600 PSI. OK. MIRU TEFTELLER. RIH TO 5215'. RETV. 'F' NIPPLE PLUG. RDMO. SIFN.

05-18-98 MIRU DOWELL ACID UNIT. SI TBG. PRESSURE @ 5:30 WAS 800 PSI. RIH WITH COILED TBG. TO 6915' CIRC. DOWELL ACIDIZE LATERAL 4A1 FROM 6915' TO 5670' WITH 17,808 GAL. OF 15% HCL ACID. ANN. PRESSURE OF 2800 PSI. POH, RD DOWELL ACID UNIT. OPEN WELL UP TO TEST TANK. TBG. PRESSURE FROM 800 PSI TO 550 PSI. SI & SDFN.

05-19-98 SITP=1140, UNSET PKR LAY DOWN, CSG FLOWING 150# PUMPED 50 BBLS 11.6# DOWN CSG, PSI TO 500, TBG DEAD, SI & SDFN.

05-20-98 SICP=600, SITP=50, WELL DEAD TOH W TBG, PKR & T/P, TIH, LATCH INTO WHIPSTOCK, TOH W TBG & WHIPSTOCK, SD DUE TO WIND, SIFN.

05-21-98 SIP @ 0600=45#, TIH W PKR, SET @ 5168.90', END OF T/P @ 5591.53', TEST TO 500-GOOD, RU DOWELL CTU, ACIDIZE LAT 3A1 W /13950 GALS 15% HCL, PULL C/T TO SURF, 1HR SITP=1534, RD CTU, SIFN.

05-22-98 SITP =1040, KILL WELL W 15 BBLS 15.5#, UNSET PKR NO BLOW, NO VAC, TOH W / PKR TIH W RET HEAD, LATCH & RELEASE W/S, TOH, ORIENTATE, TIH RESET W/S PULL 10 JTS SIFN.

05-23-98 SIP @ 0600=80, TIH W 2 7/8" PH-6 T/P, GUIBERSON UNI-VI PKR, SET PKR @ 5168.96', END OF T/P @ 5686.89', TEST PKR TO 500#, SI WELL.

05-26-98 SITP=180, RU DOWELL, ACIDIZE LAT 2A1 W/9021 GALS 15%HCL

05-27-98 SITP=940, SICP=0, BLED TO 150, UNSET PKR TOH W TBG, PKR, & T/P.

05-28-98 TIH W /T/P, PKR, SET PKR @ 5166', BOTTOM OF T/P @ 5685' TEST PKR TO 500-HELD.

05-29-98 WELL READY FOR ACID JOB ON LAT 1A1.

05-30-98 SITP=120 RU DOWELL COIL TBG UNIT. TIH W C/T, ACIDIZE W/9021 GALS 15% HCL, S/I TILL MONDAY 6/1/98.

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06-01-98 SIP @ 7:30 WAS 280 PSI, RU AND KILL WELL. POH WITH TBG. AND PKR
RIH WITH RETV. TOOLS FOR WHIPSTOCK. LATCH ONTO WHIPSTOCK, RELEASE,
POH, LAY DOWN. RIH WITH TBG. SIFN.

06-02-98 SIP @ 7:30 WAS 150 PSI. KILL WELL POH, LAY DOWN PH-6. AND LAY
DOWN. 5.5" GUIBERSON PKR. 2.875" CMT. LINED TBG. RIH TO 5204.34'. SET
GUIBERSON V1 PKR @ 5196.57'. SET TBG. HANGER. ND BOPE. NU PRODUCTION
TREE. SIFN.

06-03-98 SIP @ 7:30 WAS 0 PSI. NU PRODUCTION TREE. TEST PKR AND CSG. TO
1000 PSI. 30 MIN. OK. SIFN

06-04-98 RDMO NAVAJO WEST RIG #36, FINAL COMPLETION REPORT, TURN
WELL OVER TO PRODUCTION.

SPERRY-SUN DRILLING SERVICES

CERTIFIED SURVEY WORK SHEET

OPERATOR:	Mobil E & P Services, Inc.
WELL:	17-21 Leg 1
FIELD:	Rutherford Unit
RIG:	Big A 25
LEGALS:	
COUNTY:	San Juan
STATE:	Utah
CAL. METHOD:	Minimum Curvature
MAGNETIC DECLINATION APPLIED:	12.2
VERTICAL SEC. DIRECTION:	318
Sperry Sun Directional Drilling Supervisors :	Rod Kessel, Steve Krueger
Start Date / End Date on well (SSDS) :	4/10/98 to 4/17/98

	Main Hole =====>	1st Side Track =====>	2nd Side Track =====>	3rd Side Track =====>	4th Side Track =====>
	Survey Type	Survey Type	Survey Type	Survey Type	Survey Type
Surface Casing	5300.00 Tie On	Tie On	Tie On	Tie On	Tie On
First Survey Depth	5300.00 gyro				
Last Survey Depth	5333.00 gyro	Interpolated			
KOP Depth/Sidetrack	5340.00 MWD				
First Survey Depth	5340.00 MWD	MWD	MWD	MWD	MWD
Last Survey Depth	6628.00 MWD	MWD	MWD	MWD	MWD
Bit Extrapolation to TD	6662.00 T.D.	T.D.	T.D.	T.D.	T.D.

Note :

Examples of Survey Types:	Tie On	Tie On to Surface Casing (Assumed Vertical), Tie On to existing MWD Survey (prior drilled hole)
	MWD	Sperry Sun Drilling Services (SSDS) Measurement While Drilling (MWD) Survey's
	ESS	Sperry Sun Drilling Services (SSDS) Electronic Survey System (ESS) Survey's
	GYRO	Gyro (GYRO) Survey's ; Provided by third party vendor, or by Sperry Sun Drilling Services (SSDS)
	SS	Single Shot (SS) Survey's ; Provided by Sperry Sun Drilling Services (SSDS) or third party vendor.

Mobil

***San Juan County
Utah
Ratherford Unit
RU 17-21 - MWD Survey Leg #1***

SURVEY REPORT

28 July, 1998

sperry-sun
DRILLING SERVICES
A DIVISION OF DEERING INDUSTRIES, INC.

Survey Ref: svy2949

Sperry-Sun Drilling Services

Survey Report for RU 17-21



Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
Gyro							
0.00	0.000	0.000	0.00	0.00 N	0.00 E	0.00	
100.00	0.110	159.020	100.00	0.09 S	0.03 E	-0.09	0.110
300.00	0.630	164.230	300.00	1.33 S	0.40 E	-1.26	0.260
500.00	0.620	154.920	499.98	3.37 S	1.16 E	-3.28	0.051
700.00	0.650	170.890	699.97	5.47 S	1.80 E	-5.26	0.089
900.00	0.290	178.590	899.96	7.09 S	1.99 E	-6.60	0.182
1100.00	0.470	101.300	1099.96	7.76 S	2.81 E	-7.64	0.247
1300.00	0.200	122.340	1299.96	8.11 S	3.91 E	-8.64	0.146
1500.00	0.360	164.660	1499.95	8.90 S	4.37 E	-9.53	0.126
1700.00	0.180	1.600	1699.95	9.19 S	4.54 E	-9.87	0.267
1900.00	0.110	317.040	1899.95	8.74 S	4.42 E	-9.45	0.064
2100.00	0.090	153.460	2099.95	8.74 S	4.36 E	-9.41	0.099
2300.00	0.300	113.520	2299.95	9.09 S	4.91 E	-10.04	0.119
2500.00	0.400	177.010	2499.95	9.99 S	5.43 E	-11.06	0.189
2700.00	0.410	47.470	2699.95	10.20 S	5.99 E	-11.59	0.366
2900.00	0.450	76.980	2899.94	9.54 S	7.28 E	-11.97	0.111
3100.00	0.730	77.970	3099.93	9.10 S	9.29 E	-12.98	0.140
3300.00	0.780	80.450	3299.91	8.61 S	11.88 E	-14.35	0.030
3500.00	0.880	77.110	3499.89	8.04 S	14.72 E	-15.83	0.056
3700.00	0.610	75.850	3699.87	7.44 S	17.25 E	-17.07	0.135
3900.00	0.300	126.970	3899.87	7.49 S	18.70 E	-18.08	0.241
4100.00	0.910	93.180	4099.86	7.90 S	20.71 E	-19.72	0.341
4300.00	0.490	142.590	4299.84	8.66 S	22.81 E	-21.70	0.349
4500.00	1.020	134.780	4499.83	10.60 S	24.59 E	-24.33	0.269
4700.00	0.490	146.530	4699.81	12.56 S	26.33 E	-26.96	0.275
4900.00	0.460	145.650	4899.80	13.94 S	27.25 E	-28.60	0.015
5100.00	0.220	187.950	5099.80	14.98 S	27.65 E	-29.64	0.166
5300.00	0.190	151.630	5299.80	15.66 S	27.76 E	-30.21	0.065

MWD Survey Leg #1

5333.00	0.260	297.960	5332.80	15.67 S	27.72 E	-30.19	1.307
5340.00	3.600	318.000	5339.79	15.50 S	27.56 E	-29.96	47.956
5360.00	10.200	323.900	5359.64	13.60 S	26.09 E	-27.56	33.146
5380.00	16.700	325.300	5379.08	9.80 S	23.41 E	-22.95	32.538
5400.00	22.100	325.900	5397.93	4.32 S	19.66 E	-16.37	27.018
5420.00	28.400	328.700	5416.01	2.87 N	15.08 E	-7.96	32.053
5440.00	33.000	332.000	5433.21	11.75 N	10.05 E	2.01	24.486
5460.00	36.600	331.800	5449.63	21.81 N	4.67 E	13.09	18.009
5480.00	39.900	330.700	5465.33	32.66 N	1.29 W	25.14	16.847
5500.00	45.600	330.000	5480.01	44.46 N	8.01 W	38.39	28.598

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 17-21



Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5520.00	50.000	329.300	5493.44	57.24 N	15.49 W	52.90	22.152
5540.00	53.000	327.900	5505.89	70.59 N	23.65 W	68.28	15.968
5560.00	56.400	327.700	5517.45	84.40 N	32.35 W	84.37	17.020
5580.00	61.600	328.100	5527.75	98.92 N	41.45 W	101.25	26.056
5600.00	66.000	328.000	5536.57	114.14 N	50.95 W	118.91	22.005
5620.00	71.000	327.600	5543.90	129.88 N	60.86 W	137.25	25.069
5640.00	76.200	327.100	5549.55	146.03 N	71.21 W	156.17	26.110
5660.00	80.800	326.600	5553.53	162.44 N	81.92 W	175.53	23.130
5694.00	90.400	323.600	5556.14	190.20 N	101.30 W	209.13	29.571
5727.00	90.000	319.900	5556.02	216.11 N	121.72 W	242.05	11.277
5758.00	89.600	319.100	5556.13	239.68 N	141.86 W	273.04	2.885
5790.00	90.400	319.300	5556.13	263.91 N	162.77 W	305.03	2.577
5822.00	89.900	318.900	5556.05	288.09 N	183.72 W	337.03	2.001
5854.00	89.300	318.200	5556.27	312.08 N	204.90 W	369.02	2.881
5885.00	90.500	318.200	5556.33	335.19 N	225.56 W	400.02	3.871
5917.00	90.400	317.900	5556.07	358.99 N	246.95 W	432.02	0.988
5948.00	89.900	317.500	5555.99	381.91 N	267.82 W	463.02	2.066
5980.00	89.200	316.800	5556.25	405.37 N	289.58 W	495.02	3.094
6012.00	89.700	317.000	5556.55	428.74 N	311.44 W	527.01	1.683
6043.00	89.400	316.100	5556.80	451.24 N	332.76 W	558.00	3.060
6075.00	88.800	315.600	5557.30	474.20 N	355.05 W	589.97	2.441
6106.00	89.700	314.700	5557.70	496.17 N	376.91 W	620.93	4.106
6138.00	90.700	314.500	5557.59	518.64 N	399.69 W	652.87	3.187
6170.00	90.800	314.700	5557.17	541.11 N	422.47 W	684.81	0.699
6202.00	89.800	315.200	5557.01	563.72 N	445.12 W	716.77	3.494
6233.00	89.600	316.700	5557.17	586.00 N	466.67 W	747.75	4.881
6265.00	89.600	316.800	5557.39	609.30 N	488.60 W	779.74	0.312
6297.00	90.200	316.100	5557.45	632.50 N	510.65 W	811.73	2.881
6328.00	89.500	317.400	5557.53	655.07 N	531.89 W	842.72	4.763
6360.00	86.400	316.500	5558.67	678.44 N	553.71 W	874.69	10.087
6392.00	85.700	316.800	5560.88	701.66 N	575.63 W	906.60	2.379
6423.00	86.000	317.400	5563.12	724.30 N	596.67 W	937.52	2.159
6454.00	88.200	318.800	5564.69	747.35 N	617.35 W	968.47	8.409
6486.00	90.100	318.400	5565.16	771.35 N	638.51 W	1000.47	6.068
6517.00	91.400	317.500	5564.76	794.36 N	659.27 W	1031.46	5.100
6549.00	91.800	318.400	5563.86	818.12 N	680.69 W	1063.45	3.077
6581.00	92.900	317.700	5562.55	841.89 N	702.07 W	1095.42	4.073
6613.00	93.300	318.100	5560.82	865.60 N	723.49 W	1127.38	1.766
6628.00	92.100	318.200	5560.12	876.76 N	733.48 W	1142.36	8.028
6662.00	92.100	318.200	5558.87	902.09 N	756.13 W	1176.34	0.000

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 17-21



**Mobil
San Juan County**

**Utah
Ratherford Unit**

All data is in feet unless otherwise stated. Directions and coordinates are relative to True North.
Vertical depths are relative to Well. Northings and Eastings are relative to Well.

The Dogleg Severity is in Degrees per 100ft.
Vertical Section is from Well and calculated along an Azimuth of 318.000° (True).

Based upon Minimum Curvature type calculations, at a Measured Depth of 6662.00ft.,
The Bottom Hole Displacement is 1177.08ft., in the Direction of 320.030° (True).

SPERRY-SUN DRILLING SERVICES

CERTIFIED SURVEY WORK SHEET

OPERATOR:	Mobil E & P Services, Inc.
WELL:	17-21 Leg 2
FIELD:	Rutherford Unit
RIG:	Big A 25
LEGALS:	
COUNTY:	San Juan
STATE:	Utah
CAL. METHOD:	Minimum Curvature
MAGNETIC DECLINATION APPLIED:	12.2
VERTICAL SEC. DIRECTION:	138
Sperry Sun Directional Drilling Supervisors :	Rod Kessel, Steve Krueger
Start Date / End Date on well (SSDS) :	4/18/98 to 4/23/98

	Main Hole =====>	1st Side Track =====>	2nd Side Track =====>	3rd Side Track =====>	4th Side Track =====>
	Survey Type	Survey Type	Survey Type	Survey Type	Survey Type
Surface Casing	5300.00 Tie On	Tie On	Tie On	Tie On	Tie On
First Survey Depth	5300.00 gyro				
Last Survey Depth	5324.00 gyro	Interpolated			
KOP Depth/Sidetrack	5331.00 MWD				
First Survey Depth	5331.00 MWD	MWD	MWD	MWD	MWD
Last Survey Depth	6544.00 MWD	MWD	MWD	MWD	MWD
Bit Extrapolation to TD	6576.00 T.D.	T.D.	T.D.	T.D.	T.D.

Note :

<u>Examples of Survey Types:</u>	<p>Tie On</p> <p>MWD</p> <p>ESS</p> <p>GYRO</p> <p>SS</p>	<p>Tie On to Surface Casing (Assumed Vertical), Tie On to existing MWD Survey (prior drilled hole)</p> <p>Sperry Sun Drilling Services (SSDS) Measurement While Drilling (MWD) Survey's</p> <p>Sperry Sun Drilling Services (SSDS) Electronic Survey System (ESS) Survey's</p> <p>Gyro (GYRO) Survey's ; Provided by third party vendor, or by Sperry Sun Drilling Services (SSDS)</p> <p>Single Shot (SS) Survey's ; Provided by Sperry Sun Drilling Services (SSDS) or third party vendor.</p>
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Mobil

***San Juan County
Utah
Ratherford Unit
RU 17-21 - MWD Survey Leg #2***

SURVEY REPORT

28 July, 1998

sperry-sun
DRILLING SERVICES
A DIVISION OF PREMIER INDUSTRIES, INC.

Survey Ref: svy2952

Sperry-Sun Drilling Services

Survey Report for RU 17-21



Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
Gyro							
0.00	0.000	0.000	0.00	0.00 N	0.00 E	0.00	
100.00	0.110	159.020	100.00	0.09 S	0.03 E	0.09	0.110
300.00	0.630	164.230	300.00	1.33 S	0.40 E	1.26	0.260
500.00	0.620	154.920	499.98	3.37 S	1.16 E	3.28	0.051
700.00	0.650	170.890	699.97	5.47 S	1.80 E	5.26	0.089
900.00	0.290	178.590	899.96	7.09 S	1.99 E	6.60	0.182
1100.00	0.470	101.300	1099.96	7.76 S	2.81 E	7.64	0.247
1300.00	0.200	122.340	1299.96	8.11 S	3.91 E	8.64	0.146
1500.00	0.360	164.660	1499.95	8.90 S	4.37 E	9.53	0.126
1700.00	0.180	1.600	1699.95	9.19 S	4.54 E	9.87	0.267
1900.00	0.110	317.040	1899.95	8.74 S	4.42 E	9.45	0.064
2100.00	0.090	153.460	2099.95	8.74 S	4.36 E	9.41	0.099
2300.00	0.300	113.520	2299.95	9.09 S	4.91 E	10.04	0.119
2500.00	0.400	177.010	2499.95	9.99 S	5.43 E	11.06	0.189
2700.00	0.410	47.470	2699.95	10.20 S	5.99 E	11.59	0.366
2900.00	0.450	76.980	2899.94	9.54 S	7.28 E	11.97	0.111
3100.00	0.730	77.970	3099.93	9.10 S	9.29 E	12.98	0.140
3300.00	0.780	80.450	3299.91	8.61 S	11.88 E	14.35	0.030
3500.00	0.880	77.110	3499.89	8.04 S	14.72 E	15.83	0.056
3700.00	0.610	75.850	3699.87	7.44 S	17.25 E	17.07	0.135
3900.00	0.300	126.970	3899.87	7.49 S	18.70 E	18.08	0.241
4100.00	0.910	93.180	4099.86	7.90 S	20.71 E	19.72	0.341
4300.00	0.490	142.590	4299.84	8.66 S	22.81 E	21.70	0.349
4500.00	1.020	134.780	4499.83	10.60 S	24.59 E	24.33	0.269
4700.00	0.490	146.530	4699.81	12.56 S	26.33 E	26.96	0.275
4900.00	0.460	145.650	4899.80	13.94 S	27.25 E	28.60	0.015
5100.00	0.220	187.950	5099.80	14.98 S	27.65 E	29.64	0.166
5300.00	0.190	151.630	5299.80	15.66 S	27.76 E	30.21	0.065

MWD Survey Leg #2

5324.00	0.150	286.980	5323.80	15.68 S	27.75 E	30.22	1.312
5331.00	3.000	138.000	5330.79	15.82 S	27.86 E	30.40	44.707
5351.00	8.700	141.600	5350.68	17.39 S	29.15 E	32.43	28.545
5371.00	15.200	142.300	5370.24	20.65 S	31.70 E	36.56	32.507
5391.00	22.600	142.600	5389.15	25.79 S	35.64 E	43.01	37.003
5411.00	29.900	144.400	5407.07	32.90 S	40.88 E	51.81	36.713
5431.00	34.300	146.600	5424.01	41.67 S	46.89 E	62.34	22.760
5451.00	39.200	147.200	5440.03	51.69 S	53.42 E	74.16	24.565
5471.00	45.400	146.000	5454.82	62.92 S	60.83 E	87.46	31.261
5491.00	48.100	146.300	5468.52	75.01 S	68.95 E	101.88	13.544

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 17-21



Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5511.00	52.300	145.200	5481.32	87.71 S	77.60 E	117.10	21.420
5531.00	56.600	143.700	5492.94	100.94 S	87.06 E	133.27	22.348
5551.00	59.700	142.800	5503.50	114.55 S	97.22 E	150.18	15.964
5571.00	64.100	143.500	5512.91	128.67 S	107.80 E	167.75	22.215
5591.00	68.900	143.700	5520.89	143.43 S	118.68 E	186.00	24.017
5611.00	72.500	146.600	5527.50	158.91 S	129.46 E	204.72	22.610
5631.00	76.500	143.900	5532.84	174.74 S	140.44 E	223.83	23.857
5651.00	81.200	143.900	5536.71	190.59 S	152.00 E	243.35	23.500
5686.00	90.000	143.900	5539.39	218.76 S	172.54 E	278.03	25.143
5728.00	91.000	142.100	5539.02	252.30 S	197.82 E	319.86	4.902
5759.00	88.400	139.800	5539.19	276.37 S	217.34 E	350.82	11.197
5790.00	88.700	137.900	5539.97	299.71 S	237.74 E	381.80	6.203
5822.00	88.900	136.500	5540.64	323.18 S	259.47 E	413.79	4.418
5854.00	91.300	137.200	5540.59	346.52 S	281.36 E	445.78	7.812
5886.00	88.900	135.800	5540.53	369.73 S	303.38 E	477.77	8.683
5918.00	88.900	132.100	5541.14	391.93 S	326.41 E	509.68	11.560
5949.00	92.900	133.100	5540.66	412.91 S	349.22 E	540.53	13.300
5981.00	91.100	132.400	5539.54	434.62 S	372.71 E	572.37	6.035
6013.00	89.100	133.100	5539.49	456.34 S	396.20 E	604.24	6.622
6044.00	88.200	134.000	5540.22	477.69 S	418.66 E	635.13	4.105
6076.00	86.900	134.400	5541.58	499.98 S	441.58 E	667.03	4.250
6107.00	87.000	133.800	5543.23	521.52 S	463.81 E	697.92	1.959
6139.00	87.200	134.900	5544.85	543.86 S	486.67 E	729.81	3.490
6171.00	86.600	137.000	5546.58	566.83 S	508.88 E	761.74	6.816
6202.00	86.700	137.900	5548.39	589.62 S	529.81 E	792.69	2.916
6234.00	89.700	138.600	5549.40	613.48 S	551.10 E	824.67	9.627
6265.00	90.500	139.800	5549.35	636.95 S	571.36 E	855.66	4.652
6297.00	87.200	139.600	5549.99	661.35 S	592.05 E	887.63	10.331
6329.00	85.800	140.300	5551.94	685.79 S	612.60 E	919.56	4.890
6361.00	85.300	140.500	5554.42	710.38 S	632.94 E	951.43	1.682
6393.00	87.100	139.800	5556.54	734.89 S	653.40 E	983.34	6.034
6424.00	89.800	139.600	5557.38	758.52 S	673.44 E	1014.31	8.734
6455.00	89.700	139.800	5557.52	782.16 S	693.49 E	1045.29	0.721
6486.00	89.600	140.300	5557.71	805.93 S	713.39 E	1076.27	1.645
6518.00	90.300	141.200	5557.74	830.71 S	733.64 E	1108.24	3.563
6544.00	92.700	141.400	5557.05	850.99 S	749.89 E	1134.18	9.263
6576.00	92.700	141.400	5555.55	875.97 S	769.83 E	1166.09	0.000

All data is in feet unless otherwise stated. Directions and coordinates are relative to True North.
Vertical depths are relative to Well. Northings and Eastings are relative to Well.

The Dogleg Severity is in Degrees per 100ft.
Vertical Section is from Well and calculated along an Azimuth of 138.000° (True).

Based upon Minimum Curvature type calculations, at a Measured Depth of 6576.00ft.,
The Bottom Hole Displacement is 1166.18ft., in the Direction of 138.690° (True).

SPERRY-SUN DRILLING SERVICES

CERTIFIED SURVEY WORK SHEET

OPERATOR:	Mobil E & P Services, Inc.
WELL:	17-21 leg 3
FIELD:	Rutherford Unit
RIG:	Big A 25
LEGALS:	
COUNTY:	San Juan
STATE:	Utah
CAL. METHOD:	Minimum Curvature
MAGNETIC DECLINATION APPLIED:	12.2
VERTICAL SEC. DIRECTION:	308
Sperry Sun Directional Drilling Supervisors :	Rod Kessel, Steve Krueger
Start Date / End Date on well (SSDS) :	4/24/98 to 4/28/98

Main Hole =====> 1st Side Track =====> 2nd Side Track =====> 3rd Side Track =====> 4th Side Track =====>

	Survey Type	Survey Type	Survey Type	Survey Type	Survey Type
First Survey Depth	0.00	gyro	Tie On	Tie On	Tie On
Last Survey Depth	5339.00	gyro			
Tie-On	5300.00	Tie On			
KOP Depth/Sidetrack	5317.00	MWD			
First Survey Depth	5317.00	MWD	MWD	MWD	MWD
Last Survey Depth	6935.00	MWD	MWD	MWD	MWD
Bit Extrapolation to TD	6959.78	T.D.	T.D.	T.D.	T.D.

Note : Survey 5317 is MWD Inc and Gyro toolface dir.
Surveys with interpolated azimuths 5337 - 5357

Survey at 5309 is Interpolated gyro @ whipstock top
Surveys with magnetic interference 5377 - 5557

Examples of Survey Types:	Tie On	Tie On to Surface Casing (Assumed Vertical), Tie On to existing MWD Survey (prior drilled hole)
	MWD	Sperry Sun Drilling Services (SSDS) Measurement While Drilling (MWD) Survey's
	ESS	Sperry Sun Drilling Services (SSDS) Electronic Survey System (ESS) Survey's
	GYRO	Gyro (GYRO) Survey's ; Provided by third party vendor, or by Sperry Sun Drilling Services (SSDS)
	SS	Single Shot (SS) Survey's ; Provided by Sperry Sun Drilling Services (SSDS) or third party vendor.

Mobil

***San Juan County
Utah
Ratherford Unit
RU 17-21 - MWD Survey Leg #3***

SURVEY REPORT

28 July, 1998

sperry-sun
DRILLING SERVICES
A DIVISION OF DRESSER INDUSTRIES, INC.

Survey Ref: svy2954

Sperry-Sun Drilling Services

Survey Report for RU 17-21



Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
Gyro							
0.00	0.000	0.000	0.00	0.00 N	0.00 E	0.00	
100.00	0.110	159.020	100.00	0.09 S	0.03 E	-0.08	0.110
300.00	0.630	164.230	300.00	1.33 S	0.40 E	-1.13	0.260
500.00	0.620	154.920	499.98	3.37 S	1.16 E	-2.99	0.051
700.00	0.650	170.890	699.97	5.47 S	1.80 E	-4.78	0.089
900.00	0.290	178.590	899.96	7.09 S	1.99 E	-5.93	0.182
1100.00	0.470	101.300	1099.96	7.76 S	2.81 E	-6.99	0.247
1300.00	0.200	122.340	1299.96	8.11 S	3.91 E	-8.07	0.146
1500.00	0.360	164.660	1499.95	8.90 S	4.37 E	-8.92	0.126
1700.00	0.180	1.600	1699.95	9.19 S	4.54 E	-9.24	0.267
1900.00	0.110	317.040	1899.95	8.74 S	4.42 E	-8.86	0.064
2100.00	0.090	153.460	2099.95	8.74 S	4.36 E	-8.81	0.099
2300.00	0.300	113.520	2299.95	9.09 S	4.91 E	-9.46	0.119
2500.00	0.400	177.010	2499.95	9.99 S	5.43 E	-10.43	0.189
2700.00	0.410	47.470	2699.95	10.20 S	5.99 E	-11.00	0.366
2900.00	0.450	76.980	2899.94	9.54 S	7.28 E	-11.61	0.111
3100.00	0.730	77.970	3099.93	9.10 S	9.29 E	-12.93	0.140
3300.00	0.780	80.450	3299.91	8.61 S	11.88 E	-14.66	0.030
3500.00	0.880	77.110	3499.89	8.04 S	14.72 E	-16.55	0.056
3700.00	0.610	75.850	3699.87	7.44 S	17.25 E	-18.17	0.135
3900.00	0.300	126.970	3899.87	7.49 S	18.70 E	-19.35	0.241
4100.00	0.910	93.180	4099.86	7.90 S	20.71 E	-21.18	0.341
4300.00	0.490	142.590	4299.84	8.66 S	22.81 E	-23.31	0.349
4500.00	1.020	134.780	4499.83	10.60 S	24.59 E	-25.91	0.269
4700.00	0.490	146.530	4699.81	12.56 S	26.33 E	-28.48	0.275
4900.00	0.460	145.650	4899.80	13.94 S	27.25 E	-30.06	0.015
5100.00	0.220	187.950	5099.80	14.98 S	27.65 E	-31.02	0.166
5300.00	0.190	151.630	5299.80	15.66 S	27.76 E	-31.51	0.065

MWD Survey Leg #3

5309.00	0.080	178.480	5308.80	15.68 S	27.77 E	-31.53	1.378
5317.00	3.200	308.000	5316.79	15.54 S	27.59 E	-31.31	40.644
5337.00	8.200	305.300	5336.69	14.37 S	25.99 E	-29.33	25.029
5357.00	13.600	302.500	5356.32	12.29 S	22.84 E	-25.56	27.122
5377.00	19.300	299.800	5375.49	9.38 S	17.98 E	-19.94	28.748
5397.00	25.200	297.700	5394.00	5.75 S	11.34 E	-12.47	29.762
5417.00	31.700	296.600	5411.57	1.42 S	2.86 E	-3.12	32.604
5437.00	38.000	296.300	5427.98	3.67 N	7.37 W	8.07	31.512
5457.00	43.800	299.100	5443.09	9.77 N	18.95 W	20.95	30.408
5477.00	49.400	300.800	5456.82	17.03 N	31.53 W	35.33	28.671

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 17-21



Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5497.00	55.100	302.700	5469.06	25.36 N	44.96 W	51.04	29.471
5517.00	59.700	304.400	5479.84	34.67 N	59.00 W	67.83	24.088
5537.00	64.400	305.700	5489.21	44.82 N	73.45 W	85.47	24.191
5557.00	68.600	305.800	5497.18	55.53 N	88.33 W	103.80	21.005
5577.00	73.100	305.700	5503.74	66.57 N	103.66 W	122.67	22.505
5597.00	77.400	305.900	5508.83	77.88 N	119.35 W	141.99	21.522
5617.00	83.300	306.800	5512.18	89.56 N	135.22 W	161.69	29.831
5643.00	89.900	308.600	5513.72	105.42 N	155.74 W	187.63	26.308
5667.00	89.700	310.100	5513.81	120.64 N	174.30 W	211.62	6.305
5698.00	89.200	309.500	5514.11	140.48 N	198.12 W	242.61	2.519
5730.00	89.800	309.800	5514.39	160.90 N	222.75 W	274.59	2.096
5761.00	89.600	309.500	5514.55	180.68 N	246.62 W	305.58	1.163
5793.00	89.000	308.600	5514.94	200.84 N	271.47 W	337.57	3.380
5825.00	89.100	308.500	5515.47	220.78 N	296.49 W	369.56	0.442
5856.00	88.100	308.500	5516.23	240.07 N	320.75 W	400.55	3.226
5888.00	89.000	308.500	5517.04	259.98 N	345.78 W	432.54	2.812
5920.00	90.000	309.500	5517.32	280.12 N	370.65 W	464.53	4.419
5952.00	91.300	309.800	5516.95	300.54 N	395.28 W	496.52	4.169
5984.00	90.300	309.300	5516.51	320.91 N	419.96 W	528.50	3.494
6015.00	88.400	308.700	5516.86	340.42 N	444.04 W	559.50	6.427
6047.00	88.100	308.800	5517.83	360.44 N	468.99 W	591.48	0.988
6079.00	87.700	307.600	5519.01	380.21 N	494.12 W	623.45	3.950
6111.00	88.500	306.600	5520.07	399.51 N	519.63 W	655.43	4.001
6142.00	90.000	306.800	5520.47	418.03 N	544.48 W	686.42	4.882
6174.00	90.500	306.600	5520.33	437.15 N	570.14 W	718.41	1.683
6205.00	89.100	306.900	5520.44	455.70 N	594.97 W	749.40	4.619
6237.00	88.500	305.900	5521.11	474.69 N	620.72 W	781.38	3.644
6269.00	89.000	304.900	5521.81	493.22 N	646.80 W	813.34	3.493
6301.00	90.400	305.800	5521.98	511.73 N	672.90 W	845.31	5.201
6333.00	89.100	304.800	5522.12	530.22 N	699.02 W	877.27	5.125
6365.00	90.900	305.400	5522.12	548.62 N	725.20 W	909.23	5.929
6396.00	91.800	304.900	5521.39	566.46 N	750.54 W	940.18	3.321
6428.00	90.400	305.200	5520.77	584.84 N	776.73 W	972.13	4.474
6460.00	89.900	306.000	5520.69	603.47 N	802.75 W	1004.10	2.948
6492.00	90.300	305.400	5520.63	622.14 N	828.73 W	1036.08	2.253
6523.00	90.800	306.000	5520.34	640.23 N	853.91 W	1067.05	2.519
6554.00	91.900	306.200	5519.61	658.49 N	878.95 W	1098.02	3.607
6586.00	88.400	306.400	5519.52	677.43 N	904.73 W	1130.00	10.955
6618.00	88.000	306.900	5520.53	696.52 N	930.39 W	1161.98	2.000
6650.00	89.500	306.900	5521.23	715.73 N	955.98 W	1193.97	4.687
6681.00	90.000	308.300	5521.36	734.64 N	980.54 W	1224.96	4.795
6712.00	89.800	308.800	5521.41	753.96 N	1004.78 W	1255.96	1.737
6744.00	90.300	308.100	5521.39	773.86 N	1029.84 W	1287.96	2.688
6776.00	89.800	307.100	5521.36	793.38 N	1055.19 W	1319.96	3.494
6808.00	89.600	307.200	5521.53	812.71 N	1080.70 W	1351.96	0.699

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 17-21



Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6839.00	88.900	308.300	5521.93	831.69 N	1105.21 W	1382.95	4.206
6871.00	89.000	308.300	5522.52	851.52 N	1130.32 W	1414.95	0.313
6903.00	89.700	308.500	5522.88	871.39 N	1155.39 W	1446.94	2.275
6935.00	90.400	308.300	5522.85	891.27 N	1180.47 W	1478.94	2.275
6959.78	90.400	308.300	5522.68	906.62 N	1199.92 W	1503.72	0.000

All data is in feet unless otherwise stated. Directions and coordinates are relative to True North.
Vertical depths are relative to Well. Northings and Eastings are relative to Well.

The Dogleg Severity is in Degrees per 100ft.

Vertical Section is from Well and calculated along an Azimuth of 308.000° (True).

Based upon Minimum Curvature type calculations, at a Measured Depth of 6959.78ft.,
The Bottom Hole Displacement is 1503.92ft., in the Direction of 307.074° (True).

SPERRY-SUN DRILLING SERVICES

CERTIFIED SURVEY WORK SHEET

OPERATOR:	Mobil E & P Services, Inc.
WELL:	17-21 leg 4
FIELD:	Rutherford Unit
RIG:	Big A 25
LEGALS:	
COUNTY:	San Juan
STATE:	Utah
CAL. METHOD:	Minimum Curvature
MAGNETIC DECLINATION APPLIED:	12.2
VERTICAL SEC. DIRECTION:	128
Sperry Sun Directional Drilling Supervisors :	Steve Krueger, Bob Balbinot
Start Date / End Date on well (SSDS) :	4/29/98 to 5/3/98

	Main Hole =====>	1st Side Track =====>	2nd Side Track =====>	3rd Side Track =====>	4th Side Track =====>
	Survey Type	Survey Type	Survey Type	Survey Type	Survey Type
First Survey Depth	0.00 gyro	Tie On	Tie On	Tie On	Tie On
Last Survey Depth	5339.00 gyro				
Tie-On	5100.00 Tie On				
KOP Depth/Sidetrack	5302.00 MWD				
First Survey Depth	5302.00 MWD	MWD	MWD	MWD	MWD
Last Survey Depth	6871.00 MWD	MWD	MWD	MWD	MWD
Bit Extrapolation to TD	6915.00 T.D.	T.D.	T.D.	T.D.	T.D.
<p>Note : Survey 5302 is MWD Inc and Gyro toolface dir.</p> <p>Surveys with interpolated azimuths 5322 - 5382</p> <p>Survey at 5294 is interpolated gyro @ whipstock top</p> <p>Surveys with magnetic interference 5402</p>					
<u>Examples of Survey Types:</u>	Tie On	Tie On to Surface Casing (Assumed Vertical), Tie On to existing MWD Survey (prior drilled hole)			
	MWD	Sperry Sun Drilling Services (SSDS) Measurement While Drilling (MWD) Survey's			
	ESS	Sperry Sun Drilling Services (SSDS) Electronic Survey System (ESS) Survey's			
	GYRO	Gyro (GYRO) Survey's ; Provided by third party vendor, or by Sperry Sun Drilling Services (SSDS)			
	SS	Single Shot (SS) Survey's ; Provided by Sperry Sun Drilling Services (SSDS) or third party vendor.			

Mobil

**San Juan County
Utah
Ratherford Unit
RU 17-21 - MWD Survey Leg #4**

SURVEY REPORT

28 July, 1998

sperry-sun
DRILLING SERVICES
A DIVISION OF BECHTEL INDUSTRIES, INC.

Survey Ref: svy2956

Sperry-Sun Drilling Services

Survey Report for RU 17-21



Mobil
San Juan County

Utah
Ratherford Unit

	Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
Gyro								
	0.00	0.000	0.000	0.00	0.00 N	0.00 E	0.00	
	100.00	0.110	159.020	100.00	0.09 S	0.03 E	0.08	0.110
	300.00	0.630	164.230	300.00	1.33 S	0.40 E	1.13	0.260
	500.00	0.620	154.920	499.98	3.37 S	1.16 E	2.99	0.051
	700.00	0.650	170.890	699.97	5.47 S	1.80 E	4.78	0.089
	900.00	0.290	178.590	899.96	7.09 S	1.99 E	5.93	0.182
	1100.00	0.470	101.300	1099.96	7.76 S	2.81 E	6.99	0.247
	1300.00	0.200	122.340	1299.96	8.11 S	3.91 E	8.07	0.146
	1500.00	0.360	164.660	1499.95	8.90 S	4.37 E	8.92	0.126
	1700.00	0.180	1.600	1699.95	9.19 S	4.54 E	9.24	0.267
	1900.00	0.110	317.040	1899.95	8.74 S	4.42 E	8.86	0.064
	2100.00	0.090	153.460	2099.95	8.74 S	4.36 E	8.81	0.099
	2300.00	0.300	113.520	2299.95	9.09 S	4.91 E	9.46	0.119
	2500.00	0.400	177.010	2499.95	9.99 S	5.43 E	10.43	0.189
	2700.00	0.410	47.470	2699.95	10.20 S	5.99 E	11.00	0.366
	2900.00	0.450	76.980	2899.94	9.54 S	7.28 E	11.61	0.111
	3100.00	0.730	77.970	3099.93	9.10 S	9.29 E	12.93	0.140
	3300.00	0.780	80.450	3299.91	8.61 S	11.88 E	14.66	0.030
	3500.00	0.880	77.110	3499.89	8.04 S	14.72 E	16.55	0.056
	3700.00	0.610	75.850	3699.87	7.44 S	17.25 E	18.17	0.135
	3900.00	0.300	126.970	3899.87	7.49 S	18.70 E	19.35	0.241
	4100.00	0.910	93.180	4099.86	7.90 S	20.71 E	21.18	0.341
	4300.00	0.490	142.590	4299.84	8.66 S	22.81 E	23.31	0.349
	4500.00	1.020	134.780	4499.83	10.60 S	24.59 E	25.91	0.269
	4700.00	0.490	146.530	4699.81	12.56 S	26.33 E	28.48	0.275
	4900.00	0.460	145.650	4899.80	13.94 S	27.25 E	30.06	0.015
	5100.00	0.220	187.950	5099.80	14.98 S	27.65 E	31.02	0.166

MWD Survey Leg #4

5294.00	0.180	152.810	5293.80	15.62 S	27.74 E	31.48	0.065
5302.00	2.600	128.000	5301.79	15.75 S	27.89 E	31.67	30.472
5322.00	7.200	128.200	5321.71	16.80 S	29.23 E	33.38	23.000
5342.00	12.100	128.400	5341.43	18.88 S	31.86 E	36.73	24.501
5362.00	17.100	128.600	5360.77	22.02 S	35.81 E	41.77	25.001
5382.00	22.700	128.800	5379.57	26.27 S	41.12 E	48.58	28.002
5402.00	29.200	129.000	5397.55	31.77 S	47.92 E	57.32	32.503
5422.00	35.600	126.900	5414.42	38.34 S	56.38 E	68.03	32.487
5442.00	41.700	126.800	5430.04	45.83 S	66.37 E	80.51	30.502
5462.00	47.600	127.900	5444.26	54.36 S	77.53 E	94.56	29.751

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 17-21



Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5482.00	53.500	128.800	5456.96	63.94 S	89.64 E	110.00	29.703
5502.00	59.200	129.300	5468.04	74.43 S	102.56 E	126.64	28.576
5522.00	63.100	128.300	5477.69	85.40 S	116.21 E	144.15	19.985
5542.00	65.900	129.000	5486.30	96.67 S	130.30 E	162.20	14.352
5562.00	70.900	129.100	5493.66	108.38 S	144.74 E	180.78	25.004
5582.00	73.500	129.300	5499.77	120.42 S	159.50 E	199.82	13.035
5602.00	76.400	129.200	5504.96	132.64 S	174.45 E	219.13	14.508
5622.00	79.100	131.400	5509.21	145.28 S	189.35 E	238.65	17.256
5642.00	83.200	132.100	5512.28	158.43 S	204.09 E	258.37	20.790
5666.00	87.100	131.200	5514.31	174.32 S	221.96 E	282.23	16.674
5698.00	89.300	130.200	5515.32	195.18 S	246.21 E	314.18	7.551
5729.00	91.100	126.600	5515.21	214.43 S	270.50 E	345.17	12.983
5761.00	93.100	125.900	5514.04	233.34 S	296.28 E	377.13	6.621
5793.00	91.800	128.000	5512.67	252.55 S	321.83 E	409.09	7.713
5825.00	91.000	127.700	5511.89	272.18 S	347.09 E	441.08	2.670
5856.00	89.600	126.800	5511.72	290.95 S	371.77 E	472.08	5.369
5888.00	90.400	126.800	5511.72	310.12 S	397.39 E	504.07	2.500
5920.00	90.400	127.300	5511.50	329.40 S	422.93 E	536.07	1.562
5952.00	86.400	128.000	5512.39	348.93 S	448.25 E	568.05	12.690
5984.00	87.300	129.300	5514.15	368.89 S	473.20 E	600.00	4.936
6015.00	90.800	130.500	5514.67	388.76 S	496.98 E	630.97	11.935
6047.00	90.400	130.300	5514.33	409.50 S	521.34 E	662.94	1.398
6079.00	90.600	130.300	5514.05	430.20 S	545.75 E	694.91	0.625
6111.00	86.800	128.400	5514.78	450.48 S	570.48 E	726.89	13.275
6143.00	86.700	126.800	5516.59	469.97 S	595.79 E	758.84	5.002
6174.00	87.000	126.500	5518.30	488.45 S	620.63 E	789.78	1.368
6205.00	87.100	125.900	5519.89	506.73 S	645.61 E	820.72	1.960
6237.00	86.100	125.100	5521.79	525.28 S	671.61 E	852.64	3.999
6269.00	87.500	126.300	5523.58	543.93 S	697.56 E	884.56	5.758
6301.00	88.200	127.200	5524.78	563.06 S	723.18 E	916.53	3.561
6333.00	88.400	127.700	5525.73	582.51 S	748.57 E	948.51	1.682
6364.00	89.200	127.200	5526.37	601.35 S	773.18 E	979.50	3.043
6396.00	89.100	126.100	5526.85	620.45 S	798.85 E	1011.49	3.451
6428.00	93.200	127.000	5526.21	639.50 S	824.54 E	1043.47	13.117
6460.00	91.200	126.100	5524.98	658.54 S	850.23 E	1075.43	6.853
6491.00	89.700	127.300	5524.74	677.07 S	875.08 E	1106.42	6.196
6523.00	90.600	127.500	5524.65	696.50 S	900.51 E	1138.42	2.881
6555.00	90.600	128.700	5524.32	716.25 S	925.69 E	1170.42	3.750
6586.00	89.700	129.300	5524.24	735.76 S	949.78 E	1201.41	3.489
6618.00	91.100	129.300	5524.01	756.02 S	974.54 E	1233.40	4.375
6650.00	89.600	129.100	5523.82	776.25 S	999.34 E	1265.39	4.729
6682.00	91.100	129.100	5523.62	796.43 S	1024.17 E	1297.39	4.687
6713.00	90.400	128.700	5523.22	815.89 S	1048.29 E	1328.38	2.601
6744.00	88.700	128.400	5523.46	835.21 S	1072.53 E	1359.37	5.569
6776.00	89.500	128.400	5523.96	855.09 S	1097.61 E	1391.37	2.500

Continued...

Sperry-Sun Drilling Services

Survey Report for RU 17-21



Mobil
San Juan County

Utah
Ratherford Unit

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6808.00	90.400	128.200	5523.99	874.92 S	1122.72 E	1423.37	2.881
6840.00	91.300	127.900	5523.51	894.64 S	1147.92 E	1455.37	2.965
6871.00	90.700	127.300	5522.97	913.55 S	1172.47 E	1486.36	2.737
6915.00	90.700	127.300	5522.44	940.21 S	1207.47 E	1530.35	0.000

All data is in feet unless otherwise stated. Directions and coordinates are relative to True North.
Vertical depths are relative to Well. Northings and Eastings are relative to Well.

The Dogleg Severity is in Degrees per 100ft.

Vertical Section is from Well and calculated along an Azimuth of 128.000° (True).

Based upon Minimum Curvature type calculations, at a Measured Depth of 6915.00ft.,
The Bottom Hole Displacement is 1530.35ft., in the Direction of 127.907° (True).

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.

Use "APPLICATION FOR PERMIT - " for such proposals

SUBMIT IN TRIPLICATE

1. Type of Well

☐ Oil Well ☐ Gas Well ☒ Other

2. Name of Operator

MOBIL PRODUCING TX & NM INC.*
*MOBIL EXPLORATION & PRODUCING US INC. AS AGENT FOR MPTM

3. Address and Telephone No.

P.O. Box 633, Midland TX 79702 (915) 688-2585

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

SEC. 17, T41S, R24E
510 FNL & 1830 FWL

FORM APPROVED

Budget Bureau No. 1004-0135

Expires: March 31, 1993

5. Lease Designation and Serial No.

14-20-603-353

6. If Indian, Allottee or Tribe Name

NAVAJO TRIBAL

7. If Unit or CA, Agreement Designation

RATHERFORD UNIT

8. Well Name and No.

RATHERFORD 17-W-21

9. API Well No.

43-037-16416

10. Field and Pool, or exploratory Area

GREATER ANETH

11. County or Parish, State

SAN JUAN UT

12. CHECK APPROPRIATE BOX(es) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION

- ☒ Notice of Intent
☐ Subsequent Report
☐ Final Abandonment Notice

TYPE OF ACTION

- ☐ Abandonment
☐ Recompletion
☐ Plugging Back
☐ Casing Repair
☐ Altering Casing
☒ Other SIDETRACK/INJECTOR
☐ Change of Plans
☐ New Construction
☐ Non-Routine Fracturing
☐ Water Shut-Off
☐ Conversion to Injection
☐ Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

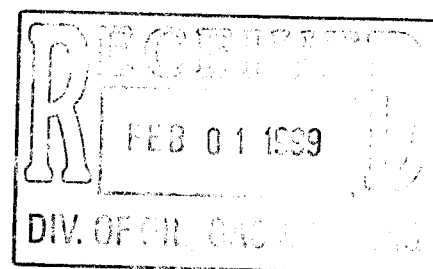
13. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

BHL:

LATERAL #1 / 902' NORTH & 756' WEST F/SURFACE SPOT (ZONE 1c/1d)
LATERAL #2 / 876' SOUTH & 770' EAST F/SURFACE SPOT (ZONE 1b)
LATERAL #3 / 907' NORTH & 1200' WEST F/SURFACE SPOT (ZONE 1a)
LATERAL #4 / 940' SOUTH & 1207' EAST F/SURFACE SPOT (ZONE 1a)

3-30-98 -- 6-04-98 HORIZONTAL RECOMPLETION.

ATTACHED FORM 15.



14. I hereby certify that the foregoing is true and correct

Signed

Shirley Houchins

Title SHIRLEY HOUCHINS/ENV & REG TECH

Date 1-28-99

(This space for Federal or State office use)

Approved by

Title

Date

Conditions of approval, if any:

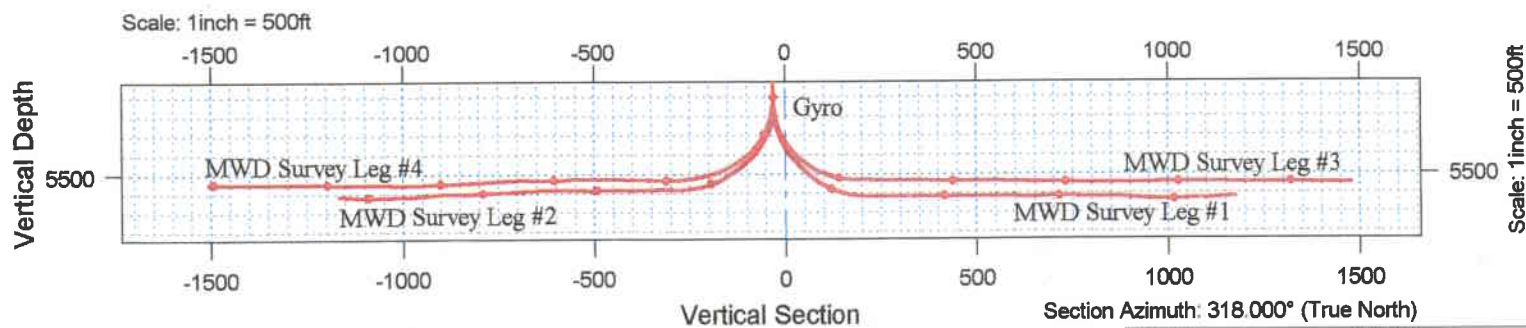
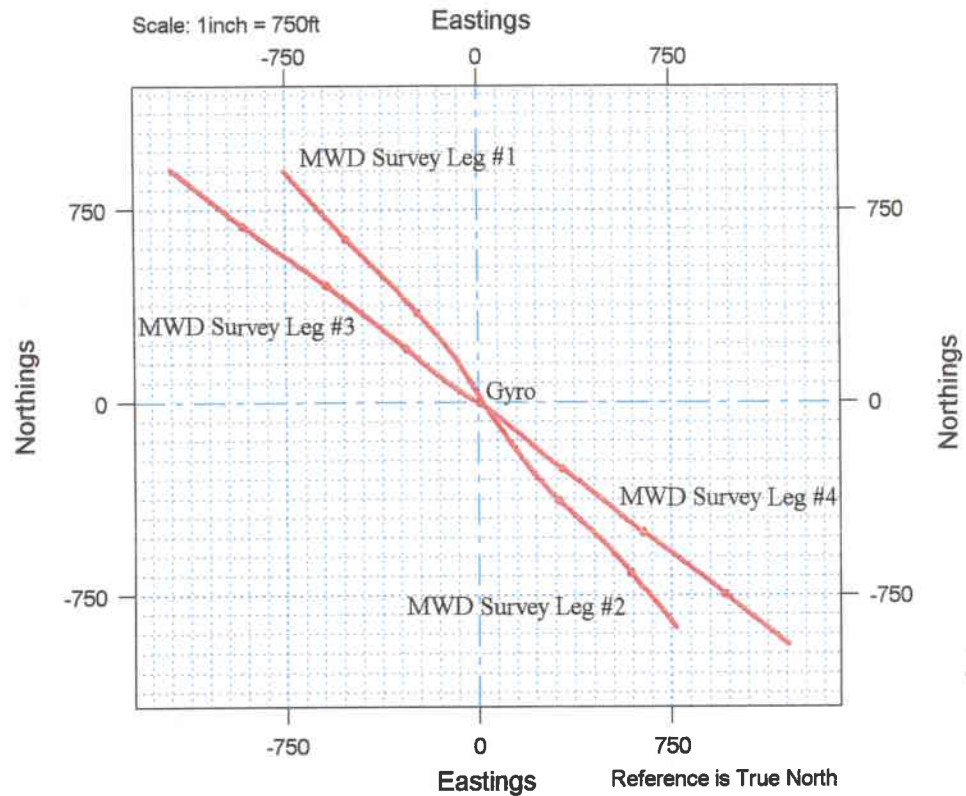
Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

* See Instruction on Reverse Side

WTC
3-1-99
nm

**San Juan County
Utah
Ratherford Unit
RU 17-21 Legs 1, 2, 3, & 4**

Mobil



Prepared: _____ Checked: _____ Approved: _____

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT - " for such proposals

SUBMIT IN TRIPLICATE

1. Type of Well

☐ Oil Well ☐ Gas Well ☒ Other

2. Name of Operator

MOBIL PRODUCING TX & NM INC.*
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3. Address and Telephone No.

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SEC. 17, T41S, R24E
510' FNL & 1830' FWL

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Budget Bureau No. 1004-0135
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RATHERFORD UNIT

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RATHERFORD 17-W-21

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43-037-16416

10. Field and Pool, or exploratory Area

GREATER ANETH

11. County or Parish, State

SAN JUAN UT

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION

- ☒ Notice of Intent
☐ Subsequent Report
☐ Final Abandonment Notice

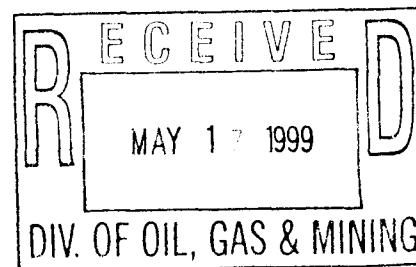
TYPE OF ACTION

- ☐ Abandonment
☐ Recompletion
☐ Plugging Back
☐ Casing Repair
☐ Altering Casing
☒ Other MIT CHART
- ☐ Change of Plans
☐ New Construction
☐ Non-Routine Fracturing
☐ Water Shut-Off
☐ Conversion to Injection
☐ Dispose Water

(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

SEE ATTACHED CHART.



14. I hereby certify that the foregoing is true and correct

Signed

Shirley Houchins

Title SHIRLEY HOCHINS/ENV & REG TECH

Date 5-12-99

(This space for Federal or State office use)

Approved by

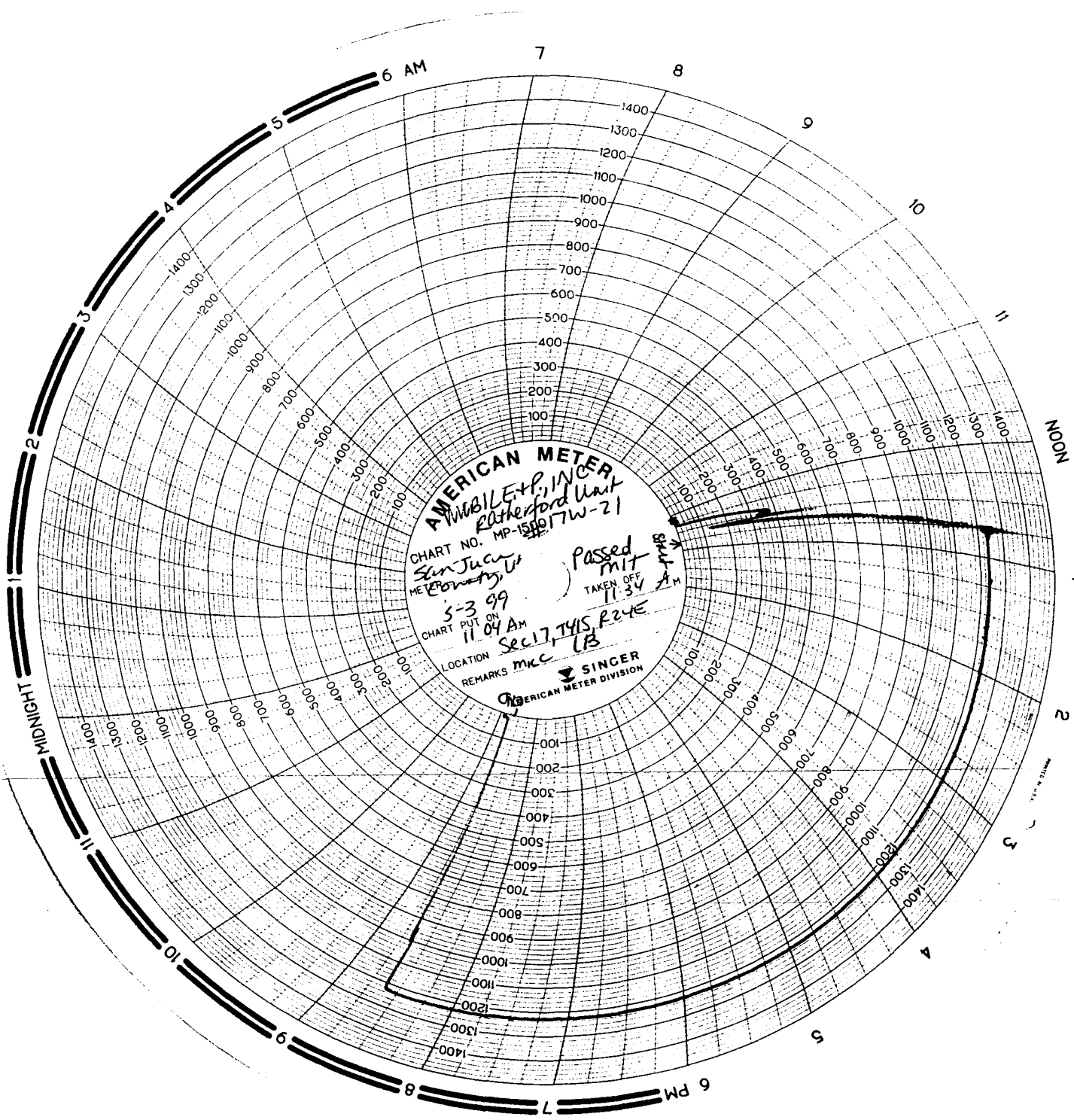
Title

Date

Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

* See Instruction on Reverse Side



ExxonMobil Production Comp.
U.S. West
P.O. Box 4358
Houston, Texas 77210-4358

June 27, 2001

ExxonMobil
Production

Mr. Jim Thompson
State of Utah, Division of Oil, Gas and Mining
1549 West North Temple
Suite 1210
Salt Lake City, UT 84114-5801

Change of Name -- Mobil Oil Corporation to
ExxonMobil Oil Corporation

Dear Mr. Thompson

Effective June 1, 2001, Mobil Oil Corporation (MOC) changed its name to ExxonMobil Oil Corporation (EMOC). This was a name change only; EMOC is the same corporation as Mobil Oil Corporation, but with a new name. No facility or other asset was transferred from one corporation to another by virtue of the name change. Specifically, EMOC will remain the owner and operator of its existing exploration and production oil and gas properties and facilities, as well as relevant permits.

There is no change to the name of Exxon Mobil Corporation, the ultimate shareholder of EMOC.

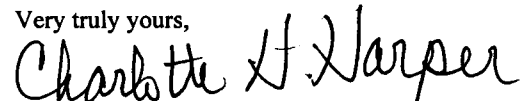
Please note the change of name of MOC to ExxonMobil Oil Corporation in your records pertaining to any MOC permits.

The Federal Identification Number for MOC (13-5401570) will remain the same for EMOC.

A copy of the Certification, Bond Rider and a list of wells are attached.

If you have any questions please feel free to call Joel Talavera at 713-431-1010

Very truly yours,



Charlotte H. Harper
Permitting Supervisor

ExxonMobil Production Company
a division of Exxon Mobil Corporation,
acting for ExxonMobil Oil Corporation

RECEIVED

JUN 27 2001

DIVISION OF
OIL GAS AND MINING



IN REPLY REFER TO:

United States Department of the Interior

BUREAU OF INDIAN AFFAIRS

NAVAJO REGION

P.O. Box 1060

Gallup, New Mexico 87305-1060

AUG 30 2001

RRES/543

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Charlotte H. Harper, Permitting Supervisor
Exxon Mobil Production Company
U. S. West
P. O. Box 4358
Houston, TX 77210-4358

Dear Ms. Harper:

This is to acknowledge receipt of your company's name change from Mobil Oil Corporation to ExxonMobil Oil Corporation effective June 1, 2001. The receipt of documents includes the Name Change Certification, current listing of Officers and Directors, Listing of Leases, Financial Statement, filing fees of \$75.00 and a copy of the Rider for Bond Number 8027 31 97. There are no other changes.

Please note that we will provide copies of these documents to other concerned parties. If you need further assistance, you may contact Ms. Bertha Spencer, Realty Specialist, at (928) 871-5938.

Sincerely,

DENNETSONE

Regional Realty Officer

cc: BLM, Farmington Field Office w/enclosures ✓
Navajo Nation Minerals Office, Attn: Mr. Akhtar Zaman, Director/w enclosures

MINERAL RESOURCES	
ADM 1	<i>DSM</i>
NATV AM MIN COORD	_____
SOLID MIN TEAM	_____
PETRO MIN TEAM	<i>2</i>
O & G INSPECT TEAM	_____
ALL TEAM LEADERS	_____
LAND RESOURCES	_____
ENVIRONMENT	_____
FILES	_____

ExxonMobil Production Company
U.S. West
P.O. Box 4358
Houston, Texas 77210-4358

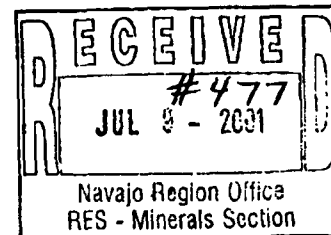
PS 7/12/01
SH
543
File

June 27, 2001

ExxonMobil
Production

Certified Mail
Return Receipt Requested

Ms. Genni Denetsone
United States Department of the Interior
Bureau of Indian Affairs, Navajo Region
Real Estate Services
P. O. Box 1060
Gallup, New Mexico 87305-1060
Mail Code 543



Change of Name –
Mobil Oil Corporation to
ExxonMobil Oil Corporation

Dear Ms. Denetsone:

Effective June 1, 2001, Mobil Oil Corporation (MOC) changed its name to ExxonMobil Oil Corporation (EMOC). This was a name change only; EMOC is the same corporation as Mobil Oil Corporation, but with a new name. No facility or other asset was transferred from one corporation to another by virtue of the name change. Specifically, EMOC will remain the owner and operator of its existing exploration and production oil and gas properties and facilities, as well as relevant permits.

There is no change to the name of Exxon Mobil Corporation, the ultimate shareholder of EMOC.

Please note the change of name of MOC to ExxonMobil Oil Corporation in your records pertaining to any MOC permits.

The Federal Identification Number for MOC (13-5401570) will remain the same for EMOC.

Attached is the Name Change Certification, Current listing of Officers and Directors, Filing Fee of \$75/-, Listing of Leases, Financial Statement and a copy of the Rider for Bond number 8027 31 97. The original Bond Rider has been sent to Ms. Barbar Davis at your Washington Office.

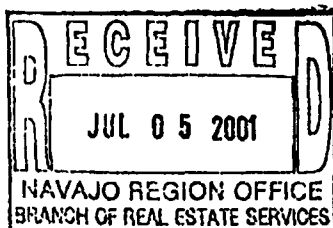
If you have any questions, please contact Alex Correa at (713) 431-1012.

Very truly yours,

Charlotte H. Harper

Charlotte H. Harper
Permitting Supervisor

Attachments



ExxonMobil Production Company
a division of Exxon Mobil Corporation,
acting for ExxonMobil Oil Corporation

NOTE: Check forwarded to Ella Isaac

Bureau of Indian Affairs
Navajo Region Office
Attn: RRES - Mineral and Mining Section
P.O. Box 1060
Gallup, New Mexico 87305-1060

Gentlemen:

The current listing of officers and director of ExxonMobil Oil Corporation (Name of Corporation), of New York (State) is as follows:

OFFICERS

President	<u>F.A. Risch</u>	Address <u>5959 Las Colinas Blvd. Irving, TX 75039</u>
Vice President	<u>K.T. Koonce</u>	Address <u>800 Bell Street Houston, TX 77002</u>
Secretary	<u>F.L. Reid</u>	Address <u>5959 Las Colinas Blvd. Irving, TX 75039</u>
Treasure	<u>B.A. Maher</u>	Address <u>5959 Las Colinas Blvd. Irving, TX 75039</u>

DIRECTORS

Name	<u>D.D. Humphreys</u>	Address <u>5959 Las Colinas Blvd. Irving, TX 75039</u>
Name	<u>P.A. Hanson</u>	Address <u>5959 Las Colinas Blvd. Irving, TX 75039</u>
Name	<u>T.P. Townsend</u>	Address <u>5959 Las Colinas Blvd. Irving, TX 75039</u>
Name	<u>B.A. Maher</u>	Address <u>5959 Las Colinas Blvd. Irving, TX 75039</u>
Name	<u>F.A. Risch</u>	Address <u>5959 Las Colinas Blvd. Irving, TX 75039</u>

Sincerely,



Alex Correa

This is to certify that the above information pertaining to ExxonMobil Oil Corporation (Corporation) is true and correct as evidenced by the records and accounts covering business for the State of Utah and in the custody of Corporation Service Company (Agent), Phone: 1 (800) 927-9800 whose business address is One Utah Center, 201 South Main Street, Salt Lake City, Utah 84111-2218



Signature

AGENT AND ATTORNEY IN FACT

Title

SAL

CERTIFICATION

I, the undersigned Assistant Secretary of ExxonMobil Oil Corporation. (formerly Mobil Oil Corporation), a corporation organized and existing under the laws of the State of New York, United States of America, DO HEREBY CERTIFY, That, the following is a true and exact copy of the resolutions adopted by the Board of Directors on May 22, 2001:

CHANGE OF COMPANY NAME

WHEREAS, the undersigned Directors of the Corporation deem it to be in the best interest of the Corporation to amend the Certificate of Incorporation of the Corporation to change the name and principal office of the Corporation:

NOW THEREFORE BE IT RESOLVED, That Article 1st relating to the corporate name is hereby amended to read as follows:

"1st The corporate name of said Company shall be,

ExxonMobil Oil Corporation",

FURTHER RESOLVED, That the amendment of the Corporation's Certificate of Incorporation referred to in the preceding resolutions be submitted to the sole shareholder of the Corporation entitled to vote thereon for its approval and, if such shareholder gives its written consent, pursuant to Section 803 of the Business Corporation Law of the State of New York, approving such amendment, the proper officers of the Corporation be, and they hereby are, authorized to execute in the name of the Corporation the Certificate of Amendment of Certificate of Incorporation, in the form attached hereto;

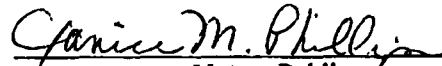
FURTHER RESOLVED, That the proper officers of the Corporation be and they hereby are authorized and directed to deliver, file and record in its behalf, the Certificate of Amendment of Certificate of Incorporation, and to take such action as may be deemed necessary or advisable to confirm and make effective in all respects the change of this Company's name to EXXONMOBIL OIL CORPORATION.

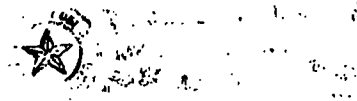
WITNESS, my hand and the seal of the Corporation at Irving, Texas, this 8th day of June, 2001.


Assistant Secretary

COUNTY OF DALLAS)
STATE OF TEXAS)
UNITED STATES OF AMERICA)

Sworn to and subscribed before me at Irving, Texas, U. S. A. on this the 8th day of June, 2001.


Notary Public



LISTING OF LEASES OF MOBIL OIL CORPORATION**Lease Number**

- 1) 14-20-0603-6504
- 2) 14-20-0603-6505
- 3) 14-20-0603-6506
- 4) 14-20-0603-6508
- 5) 14-20-0603-6509
- 6) 14-20-0603-6510
- 7) 14-20-0603-7171
- 8) 14-20-0603-7172A
- 9) 14-20-600-3530
- 10) 14-20-603-359
- 11) 14-20-603-368
- 12) 14-20-603-370
- 13) 14-20-603-370A
- 14) 14-20-603-372
- 15) 14-20-603-372A
- 16) 14-20-603-4495
- 17) 14-20-603-5447
- 18) 14-20-603-5448
- 19) 14-20-603-5449
- 20) 14-20-603-5450
- 21) 14-20-603-5451

6/1/01

CHUBB GROUP OF INSURANCE COMPANIES

One Chubb Plaza, Suite 1400, Houston, Texas 77027-3501
Telephone: (713) 227-4600 • Fax: (713) 297-4750

NW Bond

FEDERAL INSURANCE COMPANY RIDER
to be attached to and form a part of

BOND NO 8027 31 97

wherein

Mobil Oil Corporation and Mobil Exploration and Producing U.S., Inc. is
named as Principal and

FEDERAL INSURANCE COMPANY AS SURETY,

in favor of United States of America, Department of the Interior
Bureau of Indian Affairs

in the amount of \$150,000.00

bond date: 11/01/65

IT IS HEREBY UNDERSTOOD AND AGREED THAT effective June 1, 2001
the name of the Principal is changed

FROM: Mobil Oil Corporation and Mobil Exploration and Producing U.S., Inc.

TO : ExxonMobil Oil Corporation

All other terms and conditions of this Bond are unchanged.

Signed, sealed and dated this 12th of June, 2001.

ExxonMobil Oil Corporation

By:



FEDERAL INSURANCE COMPANY

By:

Mary Pierson
Mary Pierson, Attorney-in-fact

**Chubb
Surety****POWER
OF
ATTORNEY****Federal Insurance Company
Vigilant Insurance Company
Pacific Indemnity Company****Attn.: Surety Department
15 Mountain View Road
Warren, NJ 07059**

Know All by These Presents, That FEDERAL INSURANCE COMPANY, an Indiana corporation, VIGILANT INSURANCE COMPANY, a New York corporation, and PACIFIC INDEMNITY COMPANY, a Wisconsin corporation, do each hereby constitute and appoint R.F. Bobo, Mary Pierson, Philana Berros, and Jody E. Specht of Houston, Texas-----

each as their true and lawful Attorney-in-Fact to execute under such designation in their names and to affix their corporate seals to and deliver for and on their behalf as surety thereon or otherwise, bonds and undertakings and other writings obligatory in the nature thereof (other than bail bonds) given or executed in the course of business, and any instruments amending or altering the same, and consents to the modification or alteration of any instrument referred to in said bonds or obligations.

In Witness Whereof, said FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY have each executed and attested these presents and affixed their corporate seals on this 10th day of May, 2001.

Kenneth C. Wendel
Kenneth C. Wendel, Assistant Secretary

Frank E. Robertson
Frank E. Robertson, Vice President

STATE OF NEW JERSEY } ss.
County of Somerset

On this 10th day of May, 2001, before me, a Notary Public of New Jersey, personally came Kenneth C. Wendel, to me known to be Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY, the companies which executed the foregoing Power of Attorney, and the said Kenneth C. Wendel being by me duly sworn, did depose and say that he is Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY and knows the corporate seals thereof, that the seals affixed to the foregoing Power of Attorney are such corporate seals and were thereto affixed by authority of the By-Laws of said Companies; and that he signed said Power of Attorney as Assistant Secretary of said Companies by like authority; and that he is acquainted with Frank E. Robertson, and knows him to be Vice President of said Companies; and that the signature of Frank E. Robertson, subscribed to said Power of Attorney is in the genuine handwriting of Frank E. Robertson, and was thereto subscribed by authority of said Companies and in deponent's presence.



Notary Public State of New Jersey
No. 2231647

Commission Expires Oct. 28, 2004

Karen Price
Notary Public

Extract from the By-Laws of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY:

"All powers of attorney for and on behalf of the Company may and shall be executed in the name and on behalf of the Company, either by the Chairman or the President or a Vice President or an Assistant Vice President, jointly with the Secretary or an Assistant Secretary, under their respective designations. The signature of such officers may be engraved, printed or lithographed. The signature of each of the following officers: Chairman, President, any Vice President, any Assistant Vice President, any Secretary, any Assistant Secretary and the seal of the Company may be affixed by facsimile to any power of attorney or to any certificate relating thereto appointing Assistant Secretaries or Attorneys-in-Fact for purposes only of executing and attesting bonds and undertakings and other writings obligatory in the nature thereof, and any such power of attorney or certificate bearing such facsimile signature or facsimile seal shall be valid and binding upon the Company and any such power so executed and certified by such facsimile signature and facsimile seal shall be valid and binding upon the Company with respect to any bond or undertaking to which it is attached."

I, Kenneth C. Wendel, Assistant Secretary of FEDERAL INSURANCE COMPANY, VIGILANT INSURANCE COMPANY, and PACIFIC INDEMNITY COMPANY (the "Companies") do hereby certify that

- (i) the foregoing extract of the By-Laws of the Companies is true and correct,
- (ii) the Companies are duly licensed and authorized to transact surety business in all 50 of the United States of America and the District of Columbia and are authorized by the U. S. Treasury Department; further, Federal and Vigilant are licensed in Puerto Rico and the U. S. Virgin Islands, and Federal is licensed in American Samoa, Guam, and each of the Provinces of Canada except Prince Edward Island; and
- (iii) the foregoing Power of Attorney is true, correct and in full force and effect.

Given under my hand and seals of said Companies at Warren, NJ this 12th day of June, 2001.



Kenneth C. Wendel
Kenneth C. Wendel, Assistant Secretary

IN THE EVENT YOU WISH TO NOTIFY US OF A CLAIM, VERIFY THE AUTHENTICITY OF THIS BOND OR NOTIFY US OF ANY OTHER MATTER, PLEASE CONTACT US AT ADDRESS LISTED ABOVE, OR BY
Telephone (908) 903-3485 Fax (908) 903-3656 e-mail: surety@chubb.com

CSC

5184334741

06/01 '01 08:46 NO.410 03/05

CSC

06/01 '01 09:06 NO.135 02/04

F010601000187

CERTIFICATE OF AMENDMENT
OF
CERTIFICATE OF INCORPORATION
OF

MOBIL OIL CORPORATION

CSC 45

(Under Section 805 of the Business Corporation Law)

Pursuant to the provisions of Section 805 of the Business Corporation Law, the undersigned President and Secretary, respectively, of Mobil Oil Corporation hereby certify:

FIRST: That the name of the corporation is MOBIL OIL CORPORATION and that said corporation was incorporated under the name of Standard Oil Company of New York.

SECOND: That the Certificate of Incorporation of the corporation was filed by the Department of State, Albany, New York, on the 10th day of August, 1882.

THIRD: That the amendments to the Certificate of Incorporation effected by this Certificate are as follows:

(a) Article 1st of the Certificate of Incorporation, relating to the corporate name, is hereby amended to read as follows:

"1st: The corporate name of said Company shall be,
ExxonMobil Oil Corporation",

(b) Article 7th of the Certificate of Incorporation, relating to the office of the corporation is hereby amended to read as follows:

The office of the corporation within the State of New York is to be located in the County of Albany. The Company shall have offices at such other places as the Board of Directors may from time to time determine.

CSC
CSC

5184334741

06/01 '01 08:47 NO. 410 04/05
06/01 '01 09:06 NO. 133 03/04

FOURTH: That the amendments to the Certificate of Incorporation were authorized by the Board of Directors followed by the holder of all outstanding shares entitled to vote on amendments to the Certificate of Incorporation by written consent of the sole shareholder dated May 22, 2001.

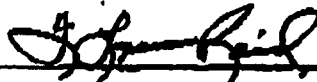
IN WITNESS WHEREOF, this Certificate has been signed this 22nd Day of May, 2001.



F. A. Risch, President

STATE OF TEXAS)
COUNTY OF DALLAS)

F. L. REID, being duly sworn, deposes and says that he is the Secretary of MOBIL OIL CORPORATION, the corporation mentioned and described in the foregoing instrument; that he has read and signed the same and that the statements contained therein are true.



F. L. REID, Secretary

SUBSCRIBED AND SWORN TO before me, the undersigned authority, on this the 22nd day of May, 2001.

[SEAL]


NOTARY PUBLIC, STATE OF TEXAS



=> CSC

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06/01'01 08:19

CSC
CSC

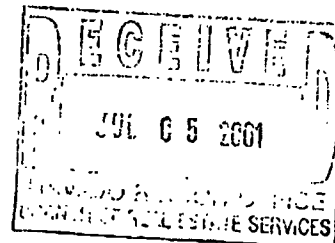
5184334741

06/01 '01 09:01 NO. 411 02/02
06/01 '01 09:06 NO. 152 04/04
F010601000187**CSC 45****CERTIFICATE OF AMENDMENT****OF****MOBIL OIL CORPORATION**

Under Section 805 of the Business Corporation Law

**STATE OF NEW YORK
DEPARTMENT OF STATE**Filed by: EXXONMOBIL CORPORATION
(Name)**FILED JUN 01 2001**6949 Las Colinas Blvd.
(Mailing address)

TAX \$

BY: *SAC*Irving, TX 75039-2298
(City, State and Zip code)*ny Albany**Cust Ref # 1655781MPJ***010601000195**

=> CSC

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06/01'01 08:19

State of New York }
Department of State } ss:

I hereby certify that the annexed copy has been compared with the original document in the custody of the Secretary of State and that the same is a true copy of said original.

Witness my hand and seal of the Department of State on **JUN 01 2001**



A handwritten signature in black ink, appearing to read "J. H. ...", written over a horizontal line.

Special Deputy Secretary of State

OPERATOR CHANGE WORKSHEET**ROUTING**

1. GLH
2. CDW
3. FILE

Change of Operator (Well Sold)

Designation of Agent

X Operator Name Change

Merger

The operator of the well(s) listed below has changed, effective: **06-01-2001**

FROM: (Old Operator):	TO: (New Operator):
MOBIL EXPLORATION & PRODUCTION	EXXONMOBIL OIL CORPORATION
Address: P O BOX DRAWER "G"	Address: U S WEST P O BOX 4358
CORTEZ, CO 81321	HOUSTON, TX 77210-4358
Phone: 1-(970)-564-5212	Phone: 1-(713)-431-1010
Account No. N7370	Account No. N1855

CA No.**Unit:****RATHERFORD****WELL(S)**

NAME	SEC TWN RNG	API NO	ENTITY NO	LEASE TYPE	WELL TYPE	WELL STATUS
NAVAJO A-9 (RATHERFORD 16W23)	16-41S-24E	43-037-15722	99990	INDIAN	WI	A
NAVAJO A-12 (RATHERFORD 16W21)	16-41S-24E	43-037-16414	99990	INDIAN	WI	A
RATHERFORD 16W43	16-41S-24E	43-037-16415	99990	INDIAN	WI	A
RATHERFORD 17-W-12	17-41S-24E	43-037-15726	6280	INDIAN	WI	A
17-14	17-41S-24E	43-037-15727	6280	INDIAN	WI	A
RATHERFORD 17-W-23	17-41S-24E	43-037-15728	6280	INDIAN	WI	A
17-32	17-41S-24E	43-037-15729	6280	INDIAN	WI	A
17-34	17-41S-24E	43-037-15730	6280	INDIAN	WI	A
17-41	17-41S-24E	43-037-15731	6280	INDIAN	WI	I
RATHERFORD 17-W-21	17-41S-24E	43-037-16416	99990	INDIAN	WI	A
RATHERFORD 17W43	17-41S-24E	43-037-16417	99990	INDIAN	WI	A
RATHERFORD 18-W-14	18-41S-24E	43-037-15735	6280	INDIAN	WI	A
18-W-32	18-41S-24E	43-037-15736	6280	INDIAN	WI	A
RATHERFORD 18-W-34	18-41S-24E	43-037-15737	6280	INDIAN	WI	A
DESERT A-4 (RATHERFORD 18W41)	18-41S-24E	43-037-15738	99990	INDIAN	WI	A
DESERT A-3 (RATHERFORD 18-W-21)	18-41S-24E	43-037-16418	99990	INDIAN	WI	A
18-23	18-41S-24E	43-037-30244	6280	INDIAN	WI	A
RATHERFORD U 18-W-12 (SDTRK)	18-41S-24E	43-037-31153	6280	INDIAN	WI	A
RATHERFORD UNIT 18-W-43B	18-41S-24E	43-037-31718	6280	INDIAN	WI	A
RATHERFORD U 19-W-12	19-41S-24E	43-037-15739	6280	INDIAN	WI	A

OPERATOR CHANGES DOCUMENTATION

Enter date after each listed item is completed

1. (R649-8-10) Sundry or legal documentation was received from the **FORMER** operator on: 06/29/2001
2. (R649-8-10) Sundry or legal documentation was received from the **NEW** operator on: 06/29/2001
3. The new company has been checked through the **Department of Commerce, Division of Corporations Database** on: 04/09/2002
4. Is the new operator registered in the State of Utah: YES Business Number: 579865-0143
5. If **NO**, the operator was contacted on: N/A

6. **Federal and Indian Lease Wells:** The BLM and or the BIA has approved the merger, name change, or operator change for all wells listed on Federal or Indian leases on: BIA-06/01/01

7. **Federal and Indian Units:**

The BLM or BIA has approved the successor of unit operator for wells listed on: 06/01/2001

8. **Federal and Indian Communization Agreements ("CA"):**

The BLM or BIA has approved the operator for all wells listed within a CA on: N/A

9. **Underground Injection Control ("UIC")** The Division has approved UIC Form 5, **Transfer of Authority to Inject**, for the enhanced/secondary recovery unit/project for the water disposal well(s) listed on: N/A

NOTE: EPA ISSUES UIC PERMIT

DATA ENTRY:

1. Changes entered in the **Oil and Gas Database** on: 04/11/2002
2. Changes have been entered on the **Monthly Operator Change Spread Sheet** on: 04/11/2002
3. Bond information entered in RBDMS on: N/A
4. Fee wells attached to bond in RBDMS on: N/A

STATE WELL(S) BOND VERIFICATION:

1. State well(s) covered by Bond Number: N/A

FEDERAL WELL(S) BOND VERIFICATION:

1. Federal well(s) covered by Bond Number: N/A

INDIAN WELL(S) BOND VERIFICATION:

1. Indian well(s) covered by Bond Number: 80273197

FEE WELL(S) BOND VERIFICATION:

1. (R649-3-1) The **NEW** operator of any fee well(s) listed covered by Bond Number N/A
2. The **FORMER** operator has requested a release of liability from their bond on: N/A
The Division sent response by letter on: N/A

LEASE INTEREST OWNER NOTIFICATION:

3. (R649-2-10) The **FORMER** operator of the fee wells has been contacted and informed by a letter from the Division of their responsibility to notify all interest owners of this change on: N/A

COMMENTS:

Division of Oil, Gas and Mining
OPERATOR CHANGE WORKSHEET

ROUTING

1. DJJ

2. CDW

X Change of Operator (Well Sold)

Operator Name Change/Merger

The operator of the well(s) listed below has changed, effective:

6/1/2006

FROM: (Old Operator):
 N1855-ExxonMobil Oil Corporation
 PO Box 4358
 Houston, TX 77210-4358
 Phone: 1 (281) 654-1936

TO: (New Operator):
 N2700-Resolute Natural Resources Company
 1675 Broadway, Suite 1950
 Denver, CO 80202
 Phone: 1 (303) 534-4600

CA No.

Unit:

RATHERFORD (UIC)

OPERATOR CHANGES DOCUMENTATION

Enter date after each listed item is completed

1. (R649-8-10) Sundry or legal documentation was received from the **FORMER** operator on: 4/21/2006
2. (R649-8-10) Sundry or legal documentation was received from the **NEW** operator on: 4/24/2006
3. The new company was checked on the **Department of Commerce, Division of Corporations Database** on: 6/7/2006
4. Is the new operator registered in the State of Utah: YES Business Number: 5733505-0143
5. If **NO**, the operator was contacted on: _____
- 6a. (R649-9-2) Waste Management Plan has been received on: requested
- 6b. Inspections of LA PA state/fee well sites complete on: n/a
- 6c. Reports current for Production/Disposition & Sundries on: ok
7. **Federal and Indian Lease Wells:** The BLM and or the BIA has approved the merger, name change, or operator change for all wells listed on Federal or Indian leases on: BLM n/a BIA not yet
8. **Federal and Indian Units:**
 The BLM or BIA has approved the successor of unit operator for wells listed on: not yet
9. **Federal and Indian Communization Agreements ("CA"):**
 The BLM or BIA has approved the operator for all wells listed within a CA on: n/a
10. **Underground Injection Control ("UIC")** The Division has approved UIC Form 5, **Transfer of Authority to Inject**, for the enhanced/secondary recovery unit/project for the water disposal well(s) listed on: 6/12/2006

DATA ENTRY:

1. Changes entered in the **Oil and Gas Database** on: 6/22/2006
2. Changes have been entered on the **Monthly Operator Change Spread Sheet** on: 6/22/2006
3. Bond information entered in RBDMS on: n/a
4. Fee/State wells attached to bond in RBDMS on: n/a
5. Injection Projects to new operator in RBDMS on: 6/22/2006
6. **Receipt of Acceptance of Drilling Procedures for APD/New** on: n/a

BOND VERIFICATION:

1. Federal well(s) covered by Bond Number: n/a
2. Indian well(s) covered by Bond Number: PA002769
3. (R649-3-1) The **NEW** operator of any fee well(s) listed covered by Bond Number n/a
- a. The **FORMER** operator has requested a release of liability from their bond on: n/a
 The Division sent response by letter on: n/a

LEASE INTEREST OWNER NOTIFICATION:

4. (R649-2-10) The **FORMER** operator of the fee wells has been contacted and informed by a letter from the Division of their responsibility to notify all interest owners of this change on: n/a

COMMENTS:

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

UIC FORM 5

TRANSFER OF AUTHORITY TO INJECT

Well Name and Number See attached list		API Number Attached
Location of Well		Field or Unit Name Ratherford Unit
Footage: See attached list	County: San Juan	Lease Designation and Number See attached list
QQ, Section, Township, Range:	State: UTAH	

EFFECTIVE DATE OF TRANSFER: 6/1/2006

CURRENT OPERATOR

Company: Exxon Mobil Oil Corporation Name: _____
Address: PO Box 4358 Signature: _____
city Houston state TX zip 77210-4358 Title: _____
Phone: (281) 654-1936 Date: _____
Comments: Exxon Mobil has submitted a separate, signed copy of UIC Form 5

NEW OPERATOR

Company: Resolute Natural Resources Company Name: Dwight E Mallory
Address: 1675 Broadway, Suite 1950 Signature: _____
city Denver state CO zip 80202 Title: Regulatory Coordinator
Phone: (303) 534-4600 Date: 4/20/2006
Comments: A list of affected UIC wells is attached.
New bond numbers for these wells are:
BIA Bond # PA002769 and US EPA Bond # B001252

(This space for State use only)

Transfer approved by: _____
Title: Field Operations Manager

Approval Date: 6/12/06

Comments:

RECEIVED
APR 24 2006

DIV. OF OIL, GAS & MINING

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

FORM 9

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.

1. TYPE OF WELL OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <u>Unit Agreement</u>		5. LEASE DESIGNATION AND SERIAL NUMBER: See attached list
2. NAME OF OPERATOR: Resolute Natural Resources Company <u>N2700</u>		6. IF INDIAN, ALLOTTEE OR TRIBE NAME: Navajo Tribe
3. ADDRESS OF OPERATOR: 1675 Broadway, Suite 1950 CITY <u>Denver</u> STATE <u>CO</u> ZIP <u>80202</u>		7. UNIT or CA AGREEMENT NAME: Ratherford Unit
4. LOCATION OF WELL FOOTAGES AT SURFACE: <u>See attached list</u>		8. WELL NAME and NUMBER: See attached list
QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN: <u>See attached list</u>		9. API NUMBER: Attached
PHONE NUMBER: (303) 534-4600		10. FIELD AND POOL, OR WILDCAT: Greater Aneth

COUNTY: San Juan

STATE: UTAH

11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION		
<input type="checkbox"/> NOTICE OF INTENT (Submit in Duplicate) Approximate date work will start: _____	<input type="checkbox"/> ACIDIZE	<input type="checkbox"/> DEEPEN	<input type="checkbox"/> REPERFORATE CURRENT FORMATION
	<input type="checkbox"/> ALTER CASING	<input type="checkbox"/> FRACTURE TREAT	<input type="checkbox"/> SIDETRACK TO REPAIR WELL
	<input type="checkbox"/> CASING REPAIR	<input type="checkbox"/> NEW CONSTRUCTION	<input type="checkbox"/> TEMPORARILY ABANDON
	<input type="checkbox"/> CHANGE TO PREVIOUS PLANS	<input checked="" type="checkbox"/> OPERATOR CHANGE	<input type="checkbox"/> TUBING REPAIR
	<input type="checkbox"/> CHANGE TUBING	<input type="checkbox"/> PLUG AND ABANDON	<input type="checkbox"/> VENT OR FLARE
<input checked="" type="checkbox"/> SUBSEQUENT REPORT (Submit Original Form Only) Date of work completion: _____	<input type="checkbox"/> CHANGE WELL NAME	<input type="checkbox"/> PLUG BACK	<input type="checkbox"/> WATER DISPOSAL
	<input type="checkbox"/> CHANGE WELL STATUS	<input type="checkbox"/> PRODUCTION (START/RESUME)	<input type="checkbox"/> WATER SHUT-OFF
	<input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS	<input type="checkbox"/> RECLAMATION OF WELL SITE	<input type="checkbox"/> OTHER: _____
	<input type="checkbox"/> CONVERT WELL TYPE	<input type="checkbox"/> RECOMPLETE - DIFFERENT FORMATION	

12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.

Effective June 1, 2006 Exxon Mobil Oil Corporation resigns as operator of the Ratherford Unit. Also effective June 1, 2006 Resolute Natural Resources Company is designated as successor operator of the Ratherford Unit.

A list of affected producing and water source wells is attached. A separate of affected injection wells is being submitted with UIC Form 5, Transfer of Authority to Inject.

As of the effective date, bond coverage for the affected wells will transfer to BIA Bond # PA002769.

NAME (PLEASE PRINT) Dwight E Mallory

TITLE Regulatory Coordinator

SIGNATURE Dwight E Mallory

DATE 4/20/2006

(This space for State use only)

APPROVED 6127106

Earlene Russell

Division of Oil, Gas and Mining
Earlene Russell, Engineering Technician

RECEIVED
APR 24 2006

DIV. OF OIL, GAS & MINING

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

FORM 9

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill new wells, significantly deepen existing wells below current bottom-hole depth, reenter plugged wells, or to drill horizontal laterals. Use APPLICATION FOR PERMIT TO DRILL form for such proposals.

1. TYPE OF WELL OIL WELL <input type="checkbox"/> GAS WELL <input type="checkbox"/> OTHER <u>Injection</u>		5. LEASE DESIGNATION AND SERIAL NUMBER:
2. NAME OF OPERATOR: ExxonMobil Oil Corporation <u>N1855</u>		6. IF INDIAN, ALLOTTEE OR TRIBE NAME: <u>Ship Rock</u>
3. ADDRESS OF OPERATOR: P.O. Box 4358 CITY <u>Houston</u> STATE <u>TX</u> ZIP <u>77210-4358</u>		7. UNIT or CA AGREEMENT NAME: <u>UTU68931A</u>
4. LOCATION OF WELL FOOTAGES AT SURFACE: QTR/QTR, SECTION, TOWNSHIP, RANGE, MERIDIAN:		8. WELL NAME and NUMBER: <u>Ratherford</u>
PHONE NUMBER: <u>(281) 654-1936</u>		9. API NUMBER: <u>attached</u>
		10. FIELD AND POOL, OR WILDCAT: <u>Aneth</u>

COUNTY: San Juan

STATE: UTAH

11. CHECK APPROPRIATE BOXES TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION		
<input checked="" type="checkbox"/> NOTICE OF INTENT (Submit in Duplicate) Approximate date work will start: <u>6/1/2006</u>	<input type="checkbox"/> ACIDIZE	<input type="checkbox"/> DEEPEN	<input type="checkbox"/> REPERFORATE CURRENT FORMATION
	<input type="checkbox"/> ALTER CASING	<input type="checkbox"/> FRACTURE TREAT	<input type="checkbox"/> SIDETRACK TO REPAIR WELL
	<input type="checkbox"/> CASING REPAIR	<input type="checkbox"/> NEW CONSTRUCTION	<input type="checkbox"/> TEMPORARILY ABANDON
	<input type="checkbox"/> CHANGE TO PREVIOUS PLANS	<input checked="" type="checkbox"/> OPERATOR CHANGE	<input type="checkbox"/> TUBING REPAIR
	<input type="checkbox"/> CHANGE TUBING	<input type="checkbox"/> PLUG AND ABANDON	<input type="checkbox"/> VENT OR FLARE
<input type="checkbox"/> SUBSEQUENT REPORT (Submit Original Form Only) Date of work completion:	<input type="checkbox"/> CHANGE WELL NAME	<input type="checkbox"/> PLUG BACK	<input type="checkbox"/> WATER DISPOSAL
	<input type="checkbox"/> CHANGE WELL STATUS	<input type="checkbox"/> PRODUCTION (START/RESUME)	<input type="checkbox"/> WATER SHUT-OFF
	<input type="checkbox"/> COMMINGLE PRODUCING FORMATIONS	<input type="checkbox"/> RECLAMATION OF WELL SITE	<input type="checkbox"/> OTHER: _____
	<input type="checkbox"/> CONVERT WELL TYPE	<input type="checkbox"/> RECOMPLETE - DIFFERENT FORMATION	

12. DESCRIBE PROPOSED OR COMPLETED OPERATIONS. Clearly show all pertinent details including dates, depths, volumes, etc.

ExxonMobil Oil Corporation is transferring operatorship of Greater Aneth field, Ratherford lease to Resolute Natural Resources Company. All change of operator notices should be made effective as of 7:00 AM MST on June 1, 2006.

Attached please find a listing of injection wells included in the transfer.

NAME (PLEASE PRINT) <u>Laurie Kilbride</u>	TITLE <u>Permitting Supervisor</u>
SIGNATURE <u>Laurie Kilbride</u>	DATE <u>4/19/2006</u>

(This space for State use only)

APPROVED 6/27/06
Earlene Russell
Division of Oil, Gas and Mining
Earlene Russell, Engineering Technician
(See Instructions on Reverse Side)

RECEIVED
APR 21 2006

GREATER ANETH FIELD UIC WELL LIST
Ratherford lease, San Juan County, Utah

Reg Lease Name	Well ID	API Num	Status	Reg Lease #	Surface Location							
					Qtr 1	Qtr 2	Sec	TN	RNG	NS Foot	EW Foot	
RATHERFORD UNIT	1W24	430371583900S1	Shut-in	14-20-603-246A	NE	SE	1	41S	23E	0651FSL	3300FEL	
RATHERFORD UNIT	2W44	430371638600S1	Active	14-20-603-246A	SE	SE	2	41S	23E	0810FSL	0510FEL	
RATHERFORD UNIT	11W42	430371584100S1	Active	14-20-603-246A	SE	NE	11	41S	23E	3290FSL	4617FWL	
RATHERFORD UNIT	11W44	430371584200S1	Shut-in	14-20-603-246A	SE	SE	11	41S	23E	0660FSL	0558FEL	
RATHERFORD UNIT	12W11	430371584300S1	Active	14-20-603-246A	NW	NW	12	41S	23E	0678FNL	4620FEL	
RATHERFORD UNIT	12W13	430371640400S1	Active	14-20-603-246A	NW	SW	12	41S	23E	1980FSL	4620FEL	
RATHERFORD UNIT	12W22	430371584501S1	Active	14-20-603-246A	SE	NW	12	41S	23E	1920FNL	2080FWL	
RATHERFORD UNIT	12W24	430373115101S1	Active	14-20-603-246A	SE	SW	12	41S	23E	0775FSL	1980FWL	
RATHERFORD UNIT	12W31	430371584700S1	Active	14-20-603-246A	NW	NE	12	41S	23E	0661FNL	1981FEL	
RATHERFORD UNIT	12W33	430371584800S1	Active	14-20-603-246A	NW	SE	12	41S	23E	1958FSL	3300FEL	
RATHERFORD UNIT	12W42	430371585000S1	Active	14-20-603-246A	SE	NE	12	41S	23E	3275FSL	0662FEL	
RATHERFORD UNIT	12W44A	430373154300S1	Shut-in	14-20-603-246A	SE	SE	12	41S	23E	0772FSL	0807FEL	
RATHERFORD UNIT	13W11	430373115201S1	Active	14-20-603-247A	NW	NW	13	41S	23E	0500FNL	0660FWL	
RATHERFORD UNIT	13W13	430371585100S1	Active	14-20-603-247A	NW	SW	13	41S	23E	1980FSL	4620FEL	
RATHERFORD UNIT	13W22	430371585200S1	Active	14-20-603-247A	SE	NW	13	41S	23E	1988FNL	3300FEL	
RATHERFORD UNIT	13W24	430371585300S1	Active	14-20-603-247A	SE	SW	13	41S	23E	0660FSL	3300FEL	
RATHERFORD UNIT	13W33	430371585501S1	Active	14-20-603-247A	NW	SE	13	41S	23E	1970FSL	1979FEL	
RATHERFORD UNIT	13W42	430371585700S1	Shut-in	14-20-603-247A	SE	NE	13	41S	23E	2139FNL	0585FEL	
RATHERFORD UNIT	13W44	430371640700S1	Active	14-20-603-247A	SE	SE	13	41S	23E	0653FSL	0659FEL	
RATHERFORD UNIT	14-31	430373171700S1	Active	14-20-603-247A	NW	NE	14	41S	23E	0754FNL	1604FEL	
RATHERFORD UNIT	14W42	430371586001S1	Active	14-20-603-247A	SE	NE	14	41S	23E	1976FNL	653FEL	
RATHERFORD UNIT	24W31	430371586200S1	Shut-in	14-20-603-247A	NW	NE	24	41S	24E	0560FNL	1830FEL	
RATHERFORD UNIT	24W42	430371586300S1	Shut-in	14-20-603-247A	SE	NE	24	41S	24E	1980FNL	0660FEL	
RATHERFORD UNIT	17W12	430371572601S1	Active	14-20-603-353	SW	NW	17	41S	24E	1980FNL	510FWL	
RATHERFORD UNIT	17W14	430371572700S1	Active	14-20-603-353	SW	SW	17	41S	24E	0610FSL	0510FWL	
RATHERFORD UNIT	17W21	430371641601S1	Active	14-20-603-353	NE	NW	17	41S	24E	0510FNL	1830FWL	
RATHERFORD UNIT	17W23	430371572801S1	Active	14-20-603-353	NE	SW	17	41S	24E	1880FSL	1980FWL	
RATHERFORD UNIT	17W32	430371572900S1	TA'd	14-20-603-353	SW	NE	17	41S	24E	1830FNL	2030FEL	
RATHERFORD UNIT	17W34	430371573000S1	Active	14-20-603-353	SW	SE	17	41S	24E	0560FSL	1880FEL	
RATHERFORD UNIT	17W41	430371573100S1	Shut-in	14-20-603-353	NE	NE	17	41S	24E	0610FNL	0510FEL	
RATHERFORD UNIT	17W43	430371641701S1	Active	14-20-603-353	NE	SE	17	41S	24E	1980FSL	0660FEL	
RATHERFORD UNIT	18-43B	430373171801S1	Active	14-20-603-353	NE	SE	18	41S	24E	2023FSL	0651FEL	
RATHERFORD UNIT	18W12	430373115301S1	Active	14-20-603-353	SW	NW	18	41S	24E	1980FNL	560FWL	
RATHERFORD UNIT	18W14	430371573501S1	Active	14-20-603-353	SW	SW	18	41S	24E	0810FSL	0600FWL	
RATHERFORD UNIT	18W21	430371641801S1	Active	14-20-603-353	NE	NW	18	41S	24E	660FNL	1882FWL	
RATHERFORD UNIT	18W23	430373024400S1	Shut-in	14-20-603-353	NE	SW	18	41S	24E	2385FSL	2040FWL	
RATHERFORD UNIT	18W32	430371573601S1	Active	14-20-603-353	SW	NE	18	41S	24E	2140FNL	1830FEL	
RATHERFORD UNIT	18W34	430371573701S1	Active	14-20-603-353	SW	SE	18	41S	24E	780FSL	1860FEL	
RATHERFORD UNIT	18W41	430371573800S1	TA'd	14-20-603-353	NE	NE	18	41S	24E	0660FNL	0660FEL	
RATHERFORD UNIT	19-12	430371573901S1	Active	14-20-603-353	SW	NW	19	41S	24E	1980FNL	0600FWL	
RATHERFORD UNIT	19-32	430371574301S1	Active	14-20-603-353	SW	NE	19	41S	24E	2717FNL	2802FEL	
RATHERFORD UNIT	19-34	430371574401S1	Active	14-20-603-353	SW	SE	19	41S	24E	0660FSL	1980FEL	
RATHERFORD UNIT	19W21	430371574100S1	Shut-in	14-20-603-353	NE	NW	19	41S	24E	0660FNL	1860FWL	
RATHERFORD UNIT	19W23	430371574200S1	Shut-in	14-20-603-353	NE	SW	19	41S	24E	2080FSL	1860FWL	
RATHERFORD UNIT	19W43	430371642000S1	Shut-in	14-20-603-353	NE	SE	19	41S	24E	1980FSL	0760FEL	
RATHERFORD UNIT	20-12	430371574601S1	Active	14-20-603-353	SW	NW	20	41S	24E	0709FNL	0748FEL	
RATHERFORD UNIT	20-14	430371574701S1	Active	14-20-603-353	SW	SW	20	41S	24E	0660FSL	0660FWL	
RATHERFORD UNIT	20-32	430371574901S1	Active	14-20-603-353	SW	NE	20	41S	24E	0037FNL	0035FWL	
RATHERFORD UNIT	20-34	430371575001S1	Active	14-20-603-353	SW	SE	20	41S	24E	0774FNL	0617FWL	
RATHERFORD UNIT	20-67	430373159000S1	Active	14-20-603-353	NE	SW	20	41S	24E	2629FSL	1412FWL	
RATHERFORD UNIT	20W21	430371642300S1	Active	14-20-603-353	NE	NW	20	41S	24E	0660FNL	1880FWL	
RATHERFORD UNIT	20W23	430371574800S1	Active	14-20-603-353	NW	SW	20	41S	24E	2080FSL	2120FWL	
RATHERFORD UNIT	20W41	430371575100S1	Active	14-20-603-353	NE	NE	20	41S	24E	0660FNL	0660FEL	
RATHERFORD UNIT	20W43	430371642400S1	TA'd	14-20-603-353	NE	SE	20	41S	24E	2070FSL	0810FEL	
RATHERFORD UNIT	16W12	430371572000S1	Active	14-20-603-355	SW	NW	16	41S	24E	1880FNL	0660FWL	

GREATER ANETH FIELD UIC WELL LIST
Ratherford lease, San Juan County, Utah

Reg Lease Name	Well ID	API Num	Status	Reg Lease #	Surface Location						
					Qtr 1	Qtr 2	Sec	TN	RNG	NS Foot	EW Foot
RATHERFORD UNIT	16W14	430371572100S1	Shut-in	14-20-603-355	SW	SW	16	41S	24E	0660FSL	0660FWL
RATHERFORD UNIT	16W21	430371641400S1	Active	14-20-603-355	NE	NW	16	41S	24E	0660FNL	1880FWL
RATHERFORD UNIT	16W23	430371572201S1	Active	14-20-603-355	NE	SW	16	41S	24E	1980FSL	1980FWL
RATHERFORD UNIT	16W43	430371641501S1	Active	14-20-603-355	NE	SE	16	41S	24E	2140FSL	0820FEL
RATHERFORD UNIT	21-14	430371575301S1	Active	14-20-603-355	SW	SW	21	41S	24E	0660FSL	0460FWL
RATHERFORD UNIT	21-67	430373175301S1	Active	14-20-603-355	NE	SW	21	41S	24E	2560FSL	1325FWL
RATHERFORD UNIT	21W21	430371642501S1	Active	14-20-603-355	NE	NW	21	41S	24E	0660FNL	2030FWL
RATHERFORD UNIT	6W14	430371598400S1	Active	14-20-603-368	NE	SE	6	41S	24E	0660FSL	0660FWL
RATHERFORD UNIT	7W12	430371598500S1	Active	14-20-603-368	NE	SE	7	41S	24E	2140FNL	0585FWL
RATHERFORD UNIT	7W14	430371598600S1	Active	14-20-603-368	NE	SE	7	41S	24E	1065FSL	0660FWL
RATHERFORD UNIT	7W21	430371639400S1	Active	14-20-603-368	NE	NW	7	41S	24E	0710FNL	1820FWL
RATHERFORD UNIT	7W34	430371598900S1	Active	14-20-603-368	SW	SE	7	41S	24E	0710FSL	2003FEL
RATHERFORD UNIT	7W43	430371639500S1	Active	14-20-603-368	NE	SE	7	41S	24E	2110FSL	0660FEL
RATHERFORD UNIT	8W14	430371599200S1	Active	14-20-603-368	SW	NE	8	41S	24E	0745FSL	0575FWL
RATHERFORD UNIT	10W43	430371640300S1	TA'd	14-20-603-4037	NE	SE	10	41S	24E	1980FSL	0550FEL
RATHERFORD UNIT	29-12	430371533701S1	Active	14-20-603-407	SW	NW	29	41S	24E	2870FNL	1422FWL
RATHERFORD UNIT	29-32	430371533901S1	Active	14-20-603-407	SW	NE	29	41S	24E	0694FNL	0685FWL
RATHERFORD UNIT	29W21	430371643200S1	Active	14-20-603-407	NE	NW	29	41S	24E	0667FNL	2122FWL
RATHERFORD UNIT	29W41	430371643300S1	Active	14-20-603-407	NE	NE	29	41S	24E	0557FNL	0591FEL
RATHERFORD UNIT	29W43	430371643400S1	Shut-in	14-20-603-407	NE	SE	29	41S	24E	1980FSL	0660FEL
RATHERFORD UNIT	30W41	430371534300S1	Shut-in	14-20-603-407	NE	NE	30	41S	24E	0660FNL	0660FEL
RATHERFORD UNIT	28-12	430371533601S1	Active	14-20-603-409	SW	SE	28	41S	24E	2121FNL	0623FWL
RATHERFORD UNIT	28W21	430371643100S1	Shut-in	14-20-603-409	NE	NW	28	41S	24E	0660FNL	2022FWL
RATHERFORD UNIT	9W23	430371639800S1	Active	14-20-603-5046	NW	SE	9	41S	24E	1980FSL	1980FWL